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MINI COMPONENT SYSTEM CRX-E200

RX-E200/NX-E200

SERVICE MANUAL

CRX-E200 is composed of RX-E200 and CDX-E200.
This is a service manual for the RX-E200 (including NX-E200).
For service manuals of CDX-E200, please refer to the service manuals with the following publication numbers :

CDX-E200 100745

IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel.
It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that any service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and part replacement. Recheck all work before you apply power to the unit.

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This Service Manual uses recycled paper.

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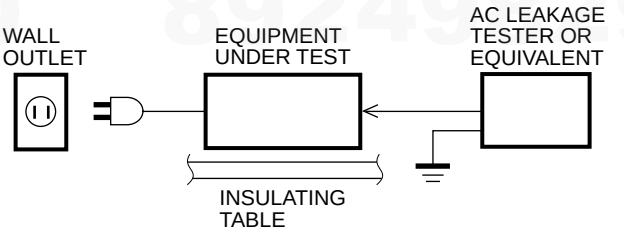
■ TO SERVICE PERSONNEL

1. Critical Components Information.
   Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
2. Leakage Current Measurement (For 120V Models Only).
   When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohm shunted by 0.15µF.



- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.

WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

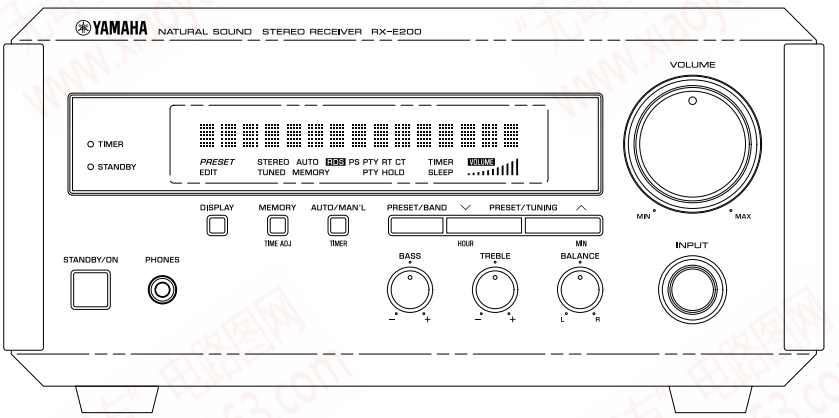
DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

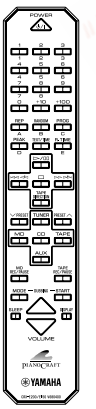
Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

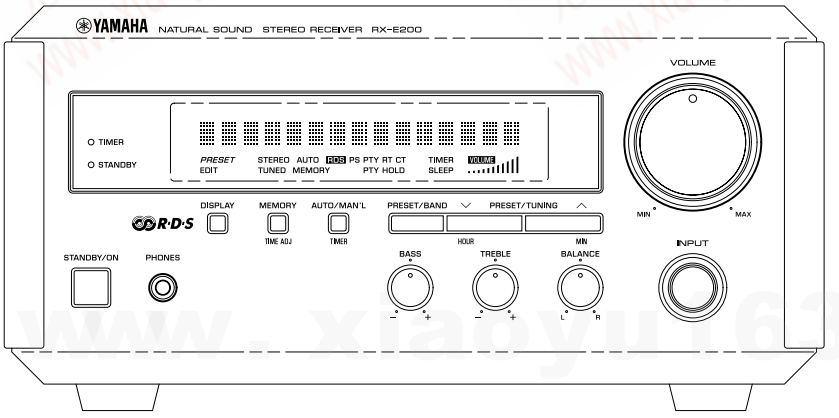
■ FRONT PANELS

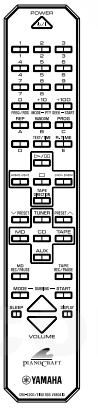
▼ U, C, R, A models





▼ B, G models





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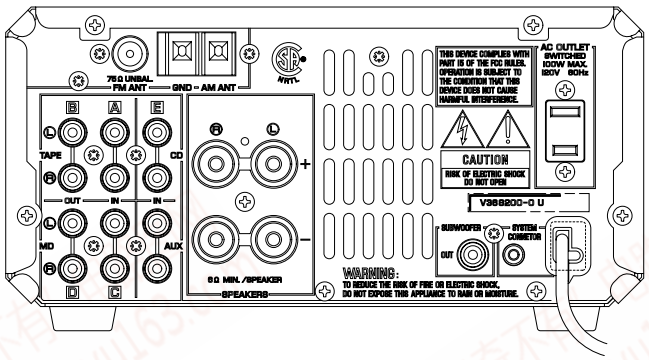
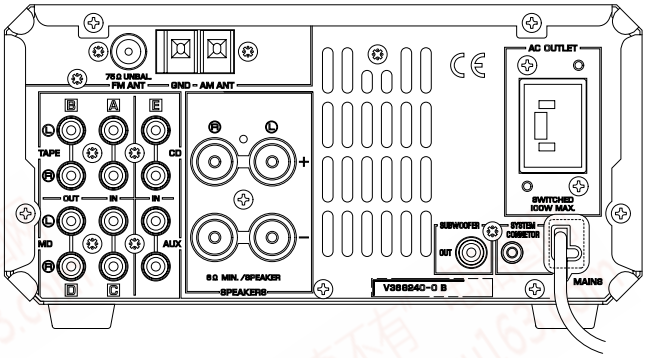
■ REAR PANELS

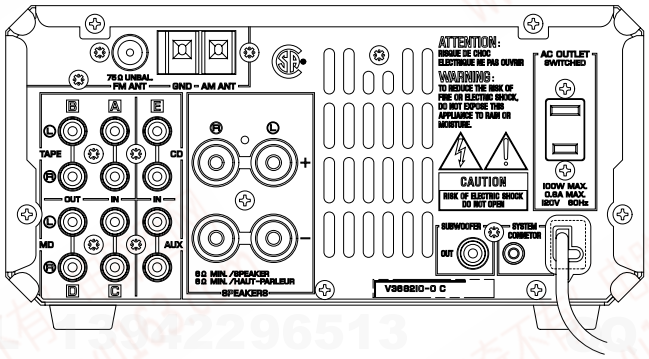
▼ U model



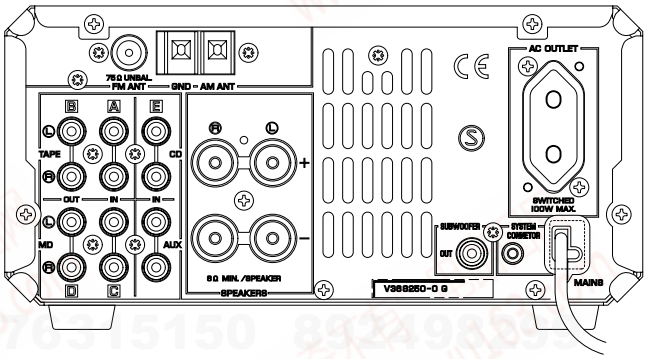
▼ B model



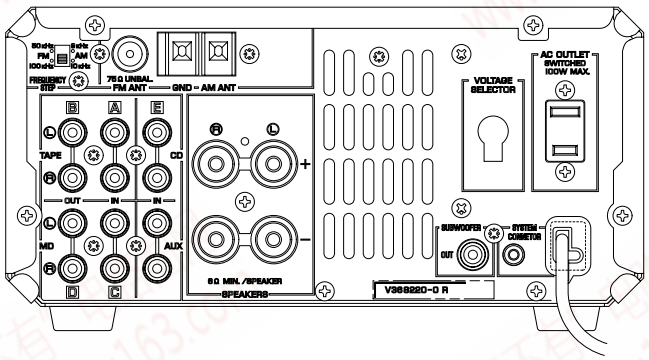
▼ C model



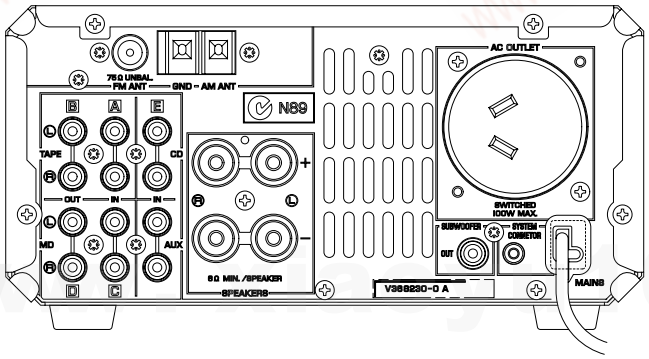
▼ G model



▼ R model



▼ A model



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■ SPECIFICATIONS

■ AUDIO SECTION

Minimum RMS Output Power per Channel
20Hz to 20kHz, 0.1% THD, 6Ω
U, C, A, B, G models . . . . . 40W + 40W
1kHz, 0.07% THD, 6Ω . . . . . 50W + 50W
Maximum Power per Channel (EIAJ)
1kHz, 10% THD, 6Ω (R model only) . . . . . 60W + 60W
Dynamic Power per Channel (IHF)
8Ω . . . . . 50W + 50W
6Ω . . . . . 65W + 65W
4Ω . . . . . 75W + 75W
2Ω . . . . . 80W + 80W
DIN Standard Output Power per Channel
1kHz, 0.7% THD, 4Ω (G model only) . . . . . 60W + 60W
Dynamic Headroom (6Ω)
U, C, models 1.0dB
IEC Power
1kHz, 0.04% THD, 6Ω (G model only) . . . . . 50W + 50W
Power Band Width
0.1% THD, 30W/6Ω . . . . . 10Hz to 50kHz
Damping Factor
20Hz to 20kHz, 6Ω . . . . . 60 or more
Input Sensitivity/Impedance
CD, etc 150mV/47kΩ
Maximum Input Signal Level (1kHz, 0.5% THD)
CD, etc 3.0V
Output Level/Impedance
REC OUT 150mV/1.2kΩ
SUB WOOFER (50Hz) 2V/730Ω
Headphone Jack Rated Output/Impedance
CD, etc 1kHz, 150mV, 6Ω 0.43V/330Ω
Frequency Response (20Hz to 20kHz)
CD, etc . . . . . 0±0.5dB
Total Harmonic Distortion (20Hz to 20kHz)
CD, etc to MAIN SP OUT (20W/6Ω) 0.04%
Signal-to-Noise Ratio (IHF-A-Network)
CD, etc, Input Shorted (150mV) 93dB
Residual Noise (IHF-A-Network)
SP OUT 100µV
Channel Separation (Vol. –30dB)
CD, etc, Input 5.1kΩ Shorted, 1kHz/10kHz 60dB/45dB
Tone Control Characteristics
BASS : Boost/cut . . . . . ±10dB (50Hz)
Turnover Frequency 350Hz
TREBLE : Boost/cut . . . . . ±10dB (20kHz)
Turnover Frequency 3.5kHz
Filter Characteristics
SUB WOOFER (L.P.F.) . . . . . fc = 100Hz, 6dB/oct.

■ TUNER SECTION

Tuner Output Level
FM (1kHz)
100% mod. U, C, R models 500mV
40kHz Dev. A, B, G models 270mV
AM (30% mod., 1kHz) 150mV

■ FM SECTION

Tuning Range
U, C models . . . . . 87.5 to 107.9MHz
A, B, G models . . . . . 87.50 to 108.00MHz
R model . . . . . 87.5 to 108.0/87.50 to 108.00MHz
Usable Sensitivity (75 Ω)
Mono (S/N 30dB) U, C, R models 1.5µV
DIN, Mono (S/N 26dB) A, B, G models 1.8µV
Alternate Channel Selectivity
U, C, R models 75dB
Selectivity (two signals, 40kHz Dev.)
A, B, G models 55dB
Signal-to-Noise Ratio
Mono/Stereo (IHF)
U, C, R models 77/71dB
Mono/Stereo (DIN-weighted, 40kHz Dev.)
A, B, G models 71/65dB
Harmonic Distortion
Mono/Stereo (1kHz) 0.5/1.0%
Frequency Response
20Hz to 15kHz . . . . . 0 ± 1.5dB
Stereo Separation
1kHz 40dB

■ AM SECTION

Tuning Range
U, C models . . . . . 530 to 1710kHz
A, B, G models . . . . . 531 to 1611kHz
R model . . . . . 530 to 1710/531 to 1611kHz
Usable Sensitivity 300µV/m
Signal-to-Noise Ratio 50dB

■ SPEAKER SECTION (NX-E200)

Type . . . . . 2way Bass-reflex Magnetic Shielding Type
Driver
Woofer . . . . . 13cm (5-1/8") Cone Type
Tweeter . . . . . 2.5cm (1") Dome Type
Frequency Response . . . . . 55Hz to 28kHz
Impedance 6Ω
Nominal Input 60W
Maximum Input 110W
Sensitivity 87dB/2.83V,1m
Crossover Frequency 3kHz
Input Terminal . . . . . Screw/Banana Type

■ GENERAL

Power Supply
U, C models . . . . . AC 120V, 60Hz
A model . . . . . AC 240V, 50Hz
B, G models . . . . . AC 230V, 50Hz
R model . . . . . AC 110/120/220/240V, 50/60Hz
Power Consumption
U, C models 110W
R, A, B, G models 100W
Standby Power Consumption
U, C models 1.3W
R, A, B, G models 1.4W

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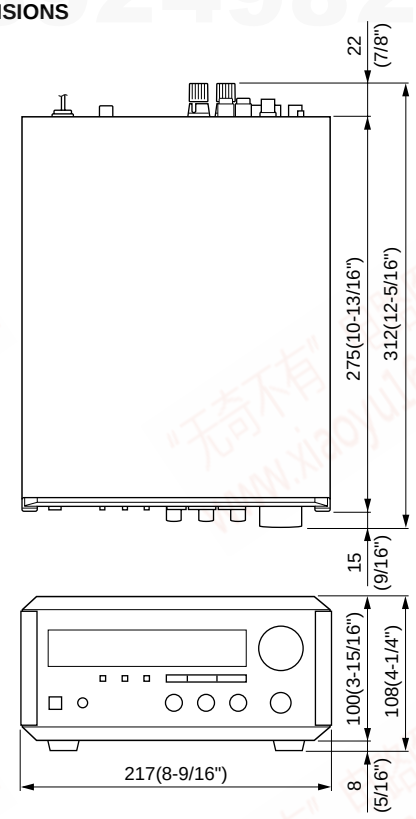
AC Outlets
Switched x 1 . . . . . 100W max
Dimensions (W x H x D)
RX-E200 . . . . . 217 x 108 x 312mm
(8-9/16" x 4-1/4" x 12-5/16")
NX-E200 . . . . . 186 x 300 x 222mm
(7-5/16" x 11-13/16" x 8-3/4")
Weight
RX-E200 . . . . . 4.5 kg (9 lbs. 14 oz)
NX-E200 . . . . . 4.0 kg (8 lbs. 13 oz)
Finish
RX-E200 U, C, R, A, B, G models . . . . . Gold color
RX-E200 U, B, G models . . . . . Silver color
NX-E200 . . . . . High Gloss Piano Finish
Accessories . . . . . AM loop antenna x 1
Indoor FM antenna x 1
Remote Control Transmitter x 1
Battery (size "UM-4E", "R03") x 4
Speaker Cord (4m) x 2

* Specifications subject to change without notice.

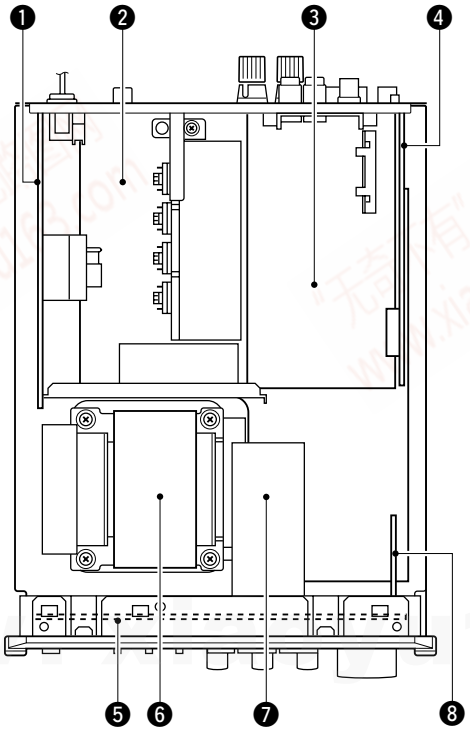
U ..... USA model
C ..... Canadian model
A ..... Australian model
B ..... British model
G ..... European model
R ..... General model

● **DIMENSIONS**



Units : mm (inch)

■ INTERNAL VIEW



❶ P. C. B. MAIN (6)
❷ P. C. B. MAIN (1)
❸ P. C. B. TUNER
❹ P. C. B. MAIN (2)
❺ P. C. B. OPERATION
❻ POWER TRANSFORMER
❼ P. C. B. MAIN (4)
❽ P. C. B. MAIN (3)

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■ DISASSEMBLY PROCEDURES (Remove parts in disassembly order as numbered.)

1. Removal of Top Cover

a. Remove 4 screws (①) and 4 screws (②) in Fig. 1.

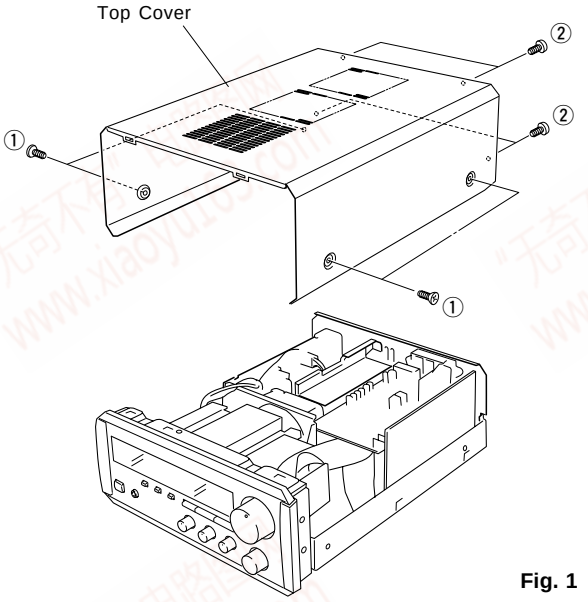

Fig. 1

2. Checking the Amp Unit and replacing parts

a. Disconnect the power plug from AC outlet.
b. Remove 2 screws (③) attaching the rear panel to the chassis. (Fig. 2)
c. Disconnect the connector for the fan.
d. Remove 3 screws (④, ⑤) attaching the fan to the chassis and then remove the fan. (Fig. 2)
e. Remove 3 screws (⑥) attaching the Main P.C.B. to the Heat Sink. (Fig. 2)
f. Loosen the wiring harness.
g. Move the Amp Unit toward the rear. (Fig. 2)
h. As shown in Fig. 3, set the Amp Unit upright.
i. Fit insulating material (thick paper, etc.)to prevent the chassis and the transformer from contacting the Main P.C.B..
j. Using a wire, connect the pin jack ground to the chassis.
(If they are left unconnected, the grounding remains open and the unit fails.)
k. Connect the power plug and turn on the power switch.
l. When replacing parts, remove 5 screws (⑦, ⑧) fixing the P.C.B. Tuner and then remove the P.C.B. Tuner. (Fig. 3)

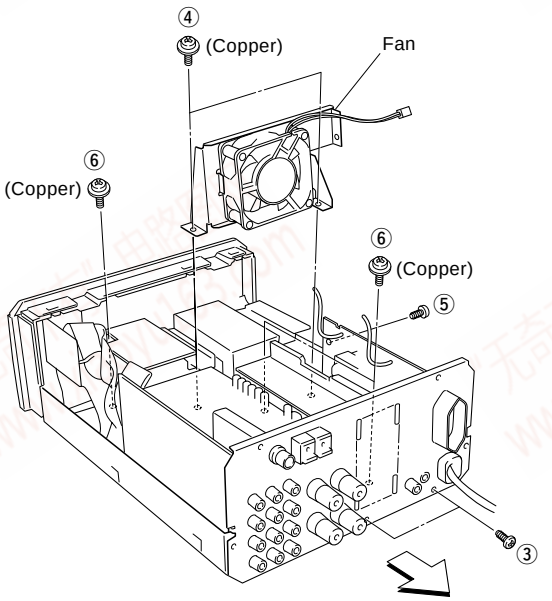

Fig. 2

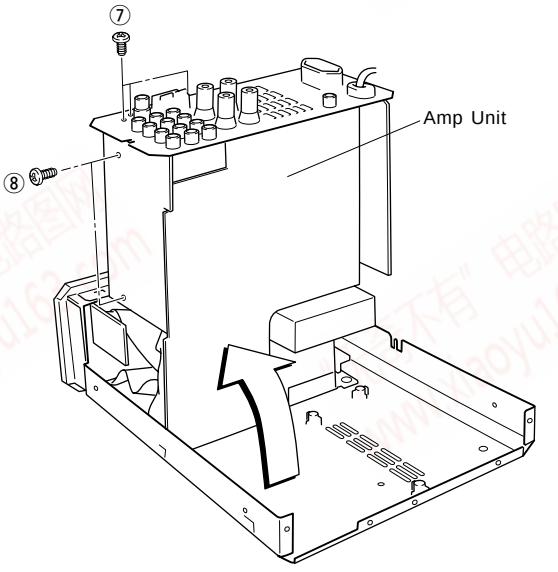

Fig. 3

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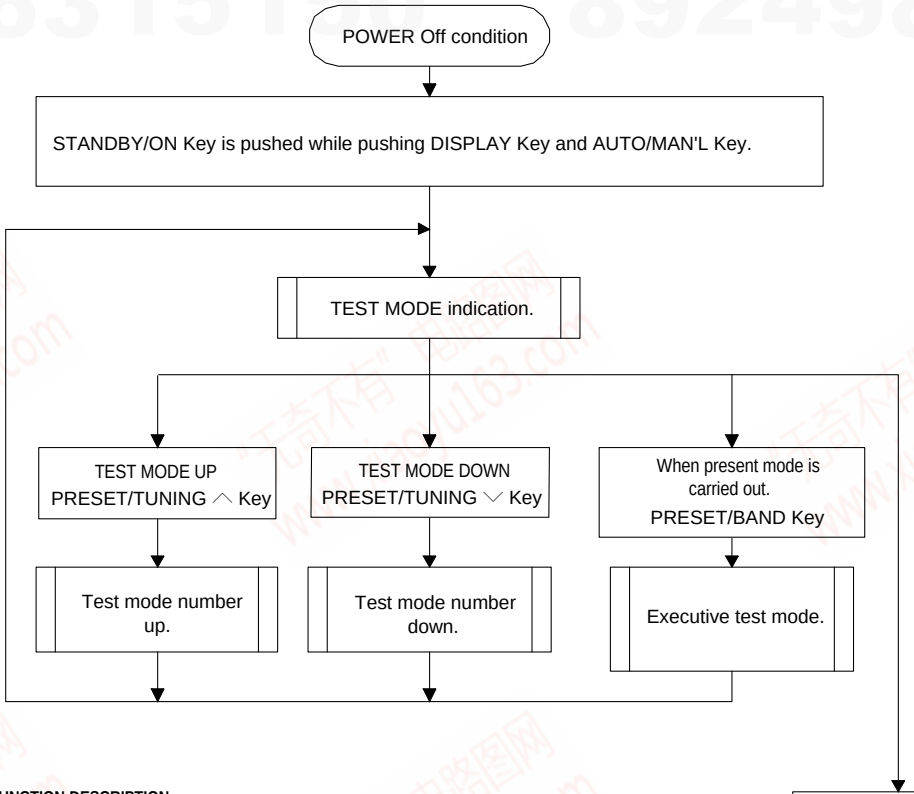
■ TEST MODE

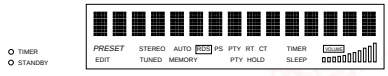


TEST PROGRAM MODE FUNCTION DESCRIPTION

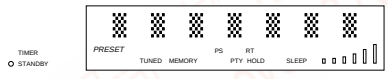
DISPLAY	FUNCTION	PRESET/BAND Key
01 DEST-B,G	Indication for destinaion. (*1)	
02 FL+CLEAR	All FL segments and BACKUP RAM CLEAR. (Note that memories set by the user will be erased.)	1st : all segments light 2nd : RAM CLEAR Also, the preset contents of the tuner are restored to the factory preset ones.
03 FL CHECK	All FL segments and circuit board short circuit inspection.	1st : all segments light 2nd : Even-numbered segments and even numbered digits are turned on. 3rd : Odd -numbered segments and odd-numbered digits are turned on.
04 FAN[Stop]	Cooling fan drive OUT	Stop/Low/High
05 Ver-Z1.02 05'99.05.28	Version information of the microcomputer software. (*2) The date of the microcomputer software. (*2)	It is changed to the date indication. It is changed to version indication.
06 SUM[5b4d]	The calculation of SUM is done and indicated after that. (*2)	Re-calculation

FL CHECK

1st



2nd



3rd

(*1)

DESTINATION	R (AM9k/FM:50k)	R (AM10k/FM100k)	A	B,G	U,C	J
Display	R9k	R10k	A	B, G	U, C	J

(*2) Contents of indication change by the microcomputer software.

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● **FACTORY PRESET**

BAND	MARKETS		PRESET No.							
			1	2	3	4	5	6	7	8
FM (MHz)	U, C, R	(100k/10k)	98.1	95.1	87.5	101.5	107.9	88.1	106.1	107.9
	A, B, G, R,	(50k/9k)	98.10	95.10	87.50	101.50	108.00	88.10	106.10	107.90
AM (kHz)	U, C, R	(100k/10k)	630	1080	1400	530	1710	900	1350	1440
	A, B, G, R	(50k/9k)	630	1080	1404	531	1611	900	1350	1440

NOTE 1) PRESET PAGE ..... A : FM B : AM C : FM D : AM E : FM

CAUTION : When executing Test mode No. 2 RAM CLEAR, be sure to write down the preset memory contents of the tuner, using a table like the one shown below. Execution of RAM CLEAR will set the memory contents of the tuner back to the factory preset state which means that all the memories preset by the user will be erased.

Preset group	P1	P2	P3	P4	P5	P6	P7	P8
A								
B								
C								
D								
E								

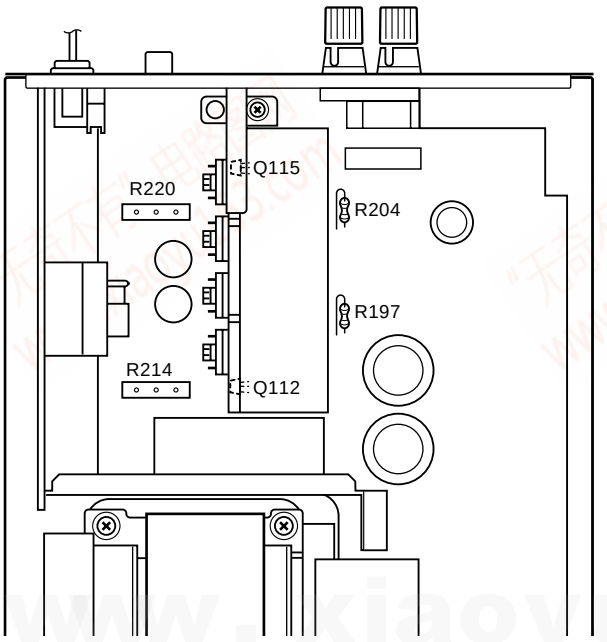
■ AMP ADJUSTMENTS

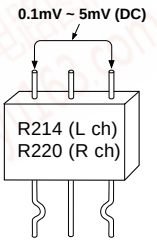
● Confirmation of Idling Current

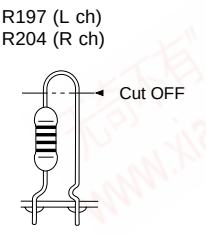
1) No signal applied.
2) Non-loaded condition.
3) Aging is not neccessary.

Item	Test Poin	Rating (DC)	Note
MAIN L	R214 (Between terminal)	0.1mV—5mV	If the measured voltage exceeds 5mV, cut the lead wire of R197(L ch) or R204(R ch) and then check again if each measured value satisfies the rating.
MAIN R	R220 (Between terminal)		

* Confirm that the idling current is 0.25mV — 15mV after 60 minutes.







Note)

- If R197(L ch) or R204(R ch) have already been cut off and idling current does not flow, reconnect R197(1kΩ) or R204(1kΩ).
- Q112 and Q115 are transistors for temperature correction. Apply silicone grease to the contact surface with the heat sink.

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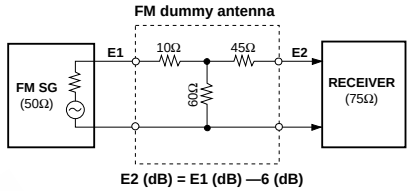
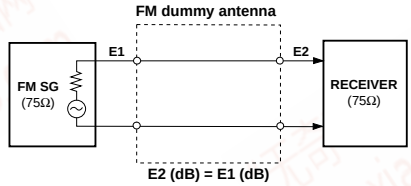
■ TUNER ADJUSTMENTS

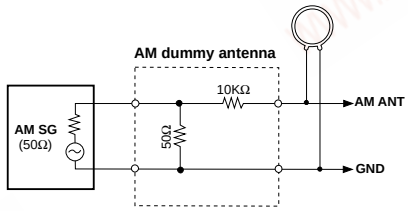
● Measuring Instruments

FM signal generator (FM SG)
Stereo signal generator (SSG)
AM signal generator (AM SG)
Distortion meter (DIST. M)
AC voltmeter (ACVM)
DC voltmeter (DCVM)
Oscilloscope
Low pass filter (YLF-15, fc=15kHz)
Oscillator

● Dummy antenna







FM Adjustment

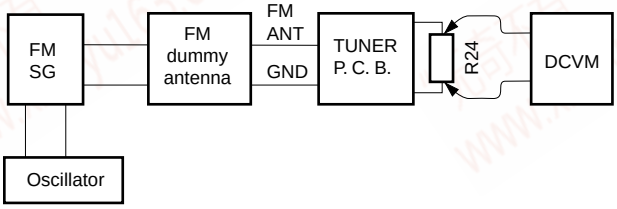
● Before Adjustment

1) For dB, 1µV=0dBµ
   Example : 60dBµ=1mV
2) 100% modulation means that the frequency deviation is ± 75kHz.
3) Install the Matching Transformer and connect FM SG.
4) Set each switch to the following position unless otherwise specified.

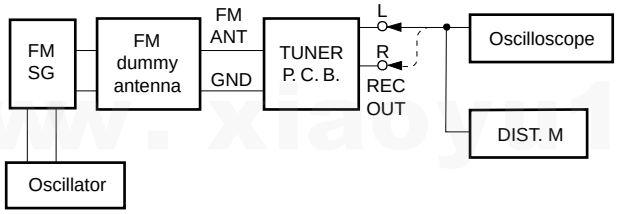
INPUT SELECTOR ..... TUNER
TUNING MODE ..... AUTO

● Connection diagram (Measuring instruments)

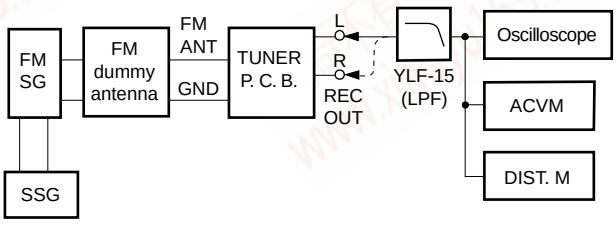
1) Discriminator balance adjustment



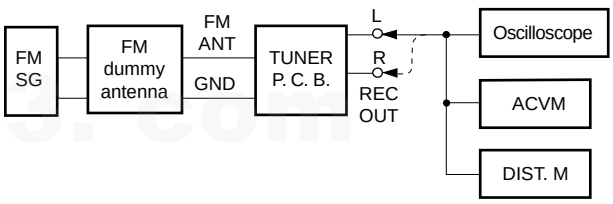
2) Monaural distortion verification



3) Stereo distortion verification/separation verification



4) Sensitivity verification



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*** :** Execution of FACTORY PRESET (Refer to page 7.) will facilitate setting reception frequency for adjustment.

Step	Adjustment item	Signal (ANT IN)	Reception frequency	Adjusted point	Test point	Rating
1	Adjustment of discriminator balance	FM ANT (75Ω) 98.1MHz ± 5kHz 70dBμ MONO 1kHz, 100% modulation	98.1MHz * (A-1)	L10	Both ends of R24 (Between pin 26 and pin 28 of IC1)	DC 0V±50mV
2	Verification of monaural distortion	FM ANT (75Ω) 98.1MHz 70dBμ MONO 1kHz, 100% modulation	98.1MHz * (A-1)		REC OUT L, R	– 36dB or less
3	Verification of stereo distortion	FM ANT (75Ω) 98.1MHz 70dBμ Stereo L or R 1kHz, 100% modulation	98.1MHz * (A-1) Tuning mode should be AUTO.		REC OUT L, R	– 29dB or less • STEREO indicator should light.
4	Verification of sensitivity	FM ANT (75Ω) 88.1MHz 98.1MHz 106.1MHz MONO 1kHz Modulation off	88.1MHz * (A-6) 98.1MHz * (A-1) 106.1MHz * (A-7)		ANT (75Ω)	1) Set the tuning mode to MAN'L MONO. (Muting OFF) 2) S/N should be 30dB at each frequency of 88.1MHz, 98.1MHz, and 106.1MHz. 3) Check to ensure that the voltage at the ANT terminal is 6dBμ (14.25dBf) or less. (A, B, G only : 10dBμ or less)
5	Verification of Separation	FM ANT (75Ω) 98.1MHz 70dBμ Stereo L or R 1kHz, 100% modulation	98.1MHz * (A-1)		REC OUT L, R	22dB or more
6	Verification of auto tuning	FM ANT (75Ω) 98.1MHz 23dBμ Stereo L or R 1kHz, 30% modulation	98.1MHz			• Automatic reception should be available when the tuning key is moved UP and DOWN. • The stereo indicator should light. • Audio muting should be applied during tuning.

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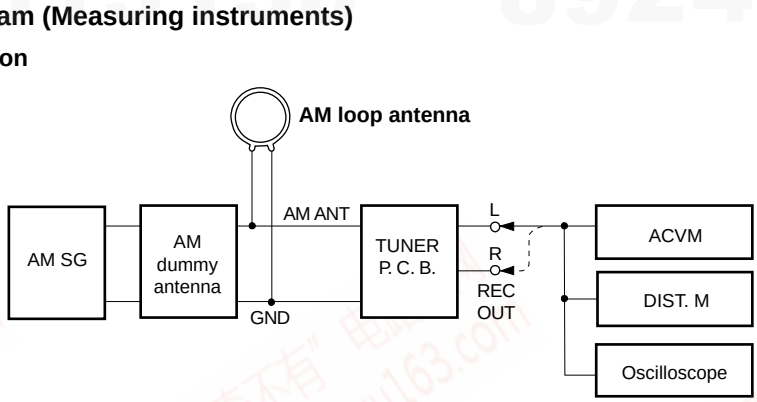
AM Adjustment (This should be done after FM adjustment.)

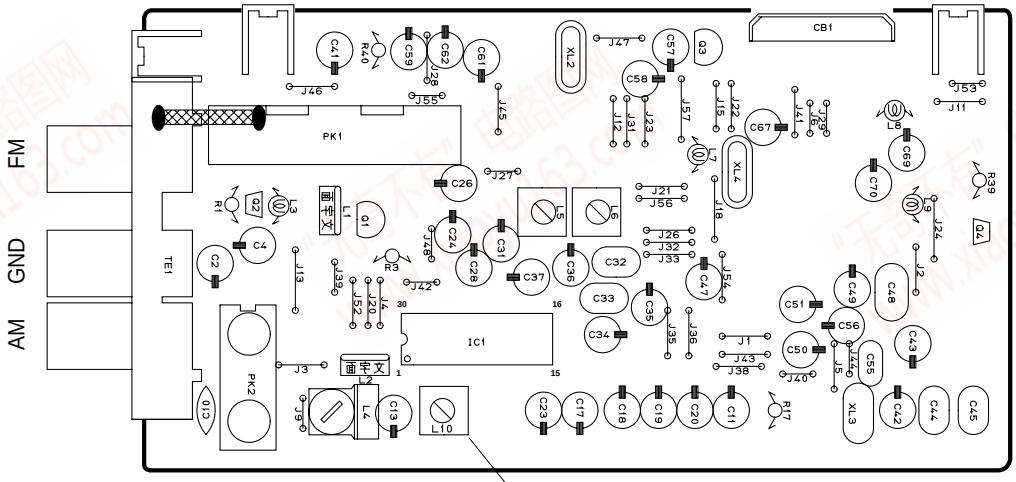
● Connection Diagram (Measuring instruments)

1) Sensitivity verification



Step	Adjustment item	Signal (ANT IN)	Reception frequency	Adjustment point	Test point	Rating
1	Verification of sensitivity	AM ANT 1080kHz 1kHz Modulation off	1080kHz * (B-2)		AM ANT	S/N should be 20dB at frequency of 1080kHz. Check to ensure that the voltage at the ANT terminal is 54dBμ or less.
2	Verification of auto tuning	AM ANT 60dBμ				Auto reception should be available when the tuning key is moved UP and DOWN.

*** :** Execution of FACTORY PRESET (Refer to page 7.) will facilitate setting reception frequency for adjustment.



Adjustment of discriminator balance

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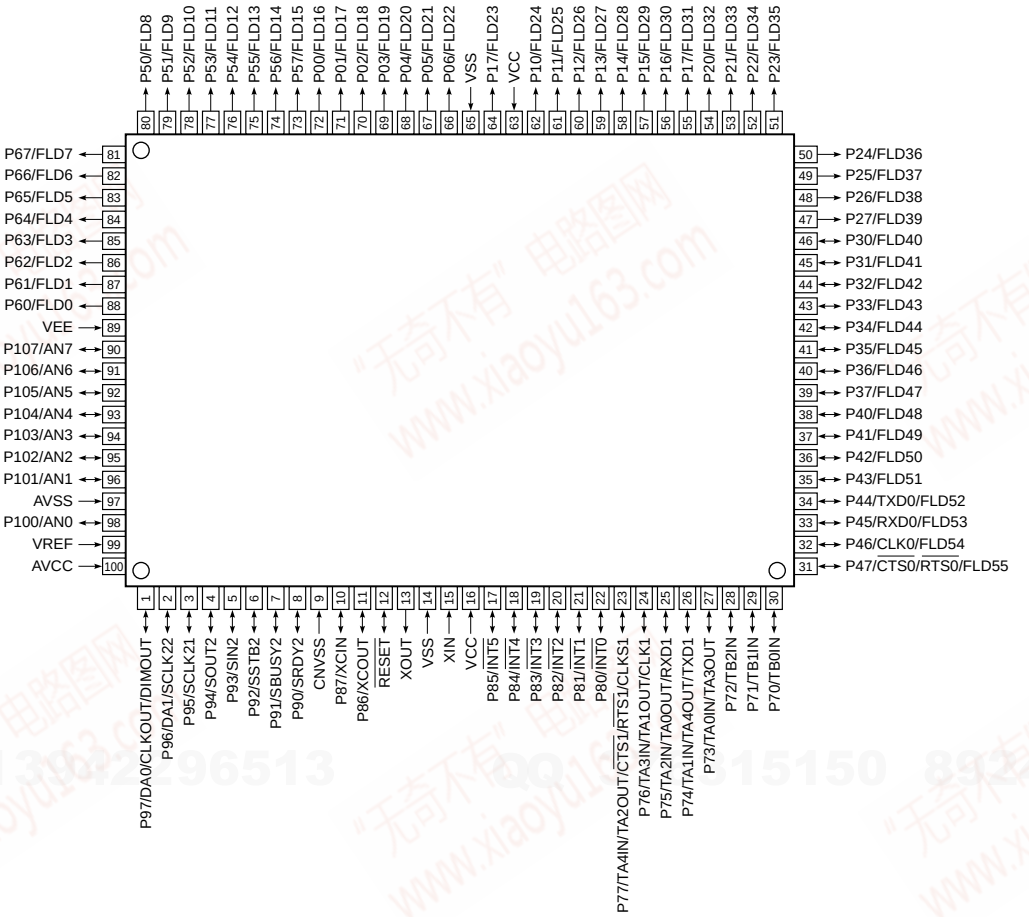
■ IC DATA

IC501 : M30217M8-A100FP (16 bit μ-COM)



No.	PORT	Name	IN/OUT	Function	
1	P97	Fan dr	OUT	Fan pulse OUT (for forced air cooling)	[0:OFF 1:ON]
2	P96	RLY PW	OUT	Power supply relay (Power ON) OUT	[0:OFF 1:ON]
3	P95	VOL DN	OUT	Motor VR DOWN OUT	[1:DOWN]
4	P94	VOL UP	OUT	Motor VR UP OUT	[1:UP]
5	P93	ENC B	IN	Rotary encoder-B IN	[Pull-up resistor]
6	P92	ENC A	IN	Rotary encoder-A IN	[Pull-up resistor]
7	P91	LED T	OUT	Timer LED OUT	[0:OFF 1:ON]
8	P90	LED S	OUT	Standby LED OUT	[0:OFF 1:ON]
9	CNVSS	CNVss	-	Connected to VSS(GND) via resistor(5.1kΩ)	
10	P87	Xin	-	32.768KHz IN	(Feedback resistor included)
11	P86	Xout	-	32.768KHz OUT	(Feedback resistor included)
12	RESET	Reset	-	RESET	[0:RESET]
13	XOUT	10Xout	-	10MHz OUT	(Feedback resistor included)
14	VSS	Vss	-	GND	
15	XIN	10Xin	-	10MHz IN	(Feedback resistor included)
16	VCC	Vcc	-	Power supply +5V	[Backup capacitor required]
17	P85	Sys O	OUT	System control OUT	
18	P84	Sys I	IN	System control IN	
19	P83	RLY SP	OUT	Speaker relay OUT	[0:OFF 1:ON]
20	P82	Pro I	IN	Amplifier current detect IN (protection)	[1:Abnormality exists]
21	P81	Rem	INT-IN	Remote control IN	
22	P80	PD	INT-IN	Power-down DC detect IN	[0:POWER DOWN]

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IC501 : M30217M8-A100FP (16 bit μ-COM)

No.	PORT	Name	IN/OUT	Function	
23	P77	CE	OUT	C2B(LC72131/LC72720/LC78211)CE OUT	[1:DATA transmission]
24	P76	CLK	S-CLK	LC72131/LC72720/LC78211 CLK OUT	(Serial I/O-1)
25	P75	DAT I	S-IN	LC72131/LC72720 DATA IN	(Serial I/O-1)
26	P74	DAT O	S-OUT	LC72131/LC72720/LC78211 DATA OUT	(Serial I/O-1)
27	P73	Mut A	OUT	AMP MUTE OUT	[0:MUTE ON]
28	P72	Mut T	OUT	Tuner MUTE OUT (TUNER)	[1:MUTE ON]
29	P71	Sta	IN	STATION IN (TUNER)	[0:Station exists]
30	P70	ST/MO	IN	STEREO/MONO IN (TUNER)	[0:STEREO]
31	P47	F CE	OUT	CE OUT(from built-in flush ROM to Busy OUT/EEPROM)	[1:DATA transmission(EEPROM)]
32	P46	F CK	S-CLK	CLK OUT(from built-in flush ROM to CLK IN/EEPROM)	(Serial I/O-0)
33	P45	F RX	S-IN	DATA IN(from DATA IN/EEPROM to built-in flush ROM)	(Serial I/O-0)
34	P44	F TX	S-OUT	DATA OUT(from built-in flush ROM to DATA OUT/EEPROM)	(Serial I/O-0)
35	P43	HP	IN	Head phone detect IN	[0:SP 1:HP]
36	P42	DIG 16	OUT	DIGIT 16 (16G)	[VEE external pull-down]
37	P41	DIG 15	OUT	DIGIT 15 (15G)	[VEE external pull-down]
38	P40	DIG 14	OUT	DIGIT 14 (14G)	[VEE external pull-down]
39	P37	DIG 13	OUT	DIGIT 13 (13G)	[VEE external pull-down]
40	P36	DIG 12	OUT	DIGIT 12 (12G)	[VEE external pull-down]
41	P35	DIG 11	OUT	DIGIT 11 (11G)	[VEE external pull-down]
42	P34	DIG 10	OUT	DIGIT 10 (10G)	[VEE external pull-down]
43	P33	DIG 9	OUT	DIGIT 9 (9G)	[VEE external pull-down]
44	P32	DIG 8	OUT	DIGIT 8 (8G)	[VEE external pull-down]
45	P31	DIG 7	OUT	DIGIT 7 (7G)	[VEE external pull-down]
46	P30	DIG 6	OUT	DIGIT 6 (6G)	[VEE external pull-down]
47	P27	DIG 5	OUT	DIGIT 5 (5G)	[VEE external pull-down]
48	P26	DIG 4	OUT	DIGIT 4 (4G)	[VEE external pull-down]
49	P25	DIG 3	OUT	DIGIT 3 (3G)	[VEE external pull-down]
50	P24	DIG 2	OUT	DIGIT 2 (2G)	[VEE external pull-down]
51	P23	DIG 1	OUT	DIGIT 1 (1G)	[VEE external pull-down]
52	P22	SEG 1	OUT	SEGMENT 1 (P1)	[VEE external pull-down]
53	P21	SEG 2	OUT	SEGMENT 2 (P2)	[VEE external pull-down]
54	P20	SEG 3	OUT	SEGMENT 3 (P3)	[VEE external pull-down]
55	P17	SEG 4	OUT	SEGMENT 4 (P4)	(VEE internal pull-down)
56	P16	SEG 5	OUT	SEGMENT 5 (P5)	(VEE internal pull-down)
57	P15	SEG 6	OUT	SEGMENT 6 (P6)	(VEE internal pull-down)
58	P14	SEG 7	OUT	SEGMENT 7 (P7)	(VEE internal pull-down)
59	P13	SEG 8	OUT	SEGMENT 8 (P8)	(VEE internal pull-down)
60	P12	SEG 9	OUT	SEGMENT 9 (P9)	(VEE internal pull-down)
61	P11	SEG 10	OUT	SEGMENT 10 (P10)	(VEE internal pull-down)
62	P10	SEG 11	OUT	SEGMENT 11 (P11)	(VEE internal pull-down)
63	VCC	Vcc	-	Power supply +5V	[Back-up capacitor]
64	P07	SEG 12	OUT	SEGMENT 12 (P12)	(VEE internal pull-down)
65	VSS	Vss	-	GND	
66	P06	SEG 13	OUT	SEGMENT 13 (P13)	(VEE internal pull-down)
67	P05	SEG 14	OUT	SEGMENT 14 (P14)	(VEE internal pull-down)
68	P04	SEG 15	OUT	SEGMENT 15 (P15)	(VEE internal pull-down)
69	P03	SEG 16	OUT	SEGMENT 16 (P16)	(VEE internal pull-down)
70	P02	SEG 17	OUT	SEGMENT 17 (P17)	(VEE internal pull-down)
71	P01	SEG 18	OUT	SEGMENT 18 (P18)	(VEE internal pull-down)
72	P00	SEG 19	OUT	SEGMENT 19 (P19)	(VEE internal pull-down)
73	P57	SEG 20	OUT	SEGMENT 20 (P20)	(VEE internal pull-down)
74	P56	SEG 21	OUT	SEGMENT 21 (P21)	(VEE internal pull-down)
75	P55	SEG 22	OUT	SEGMENT 22 (P22)	(VEE internal pull-down)
76	P54	SEG 23	OUT	SEGMENT 23 (P23)	(VEE internal pull-down)
77	P53	SEG 24	OUT	SEGMENT 24 (P24)	(VEE internal pull-down)

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IC501 : M30217M8-A100FP (16 bit μ-COM)

No.	PORT	Name	IN/OUT	Function	
78	P52	SEG 25	OUT	SEGMENT 25 (P25)	(VEE internal pull-down)
79	P51	SEG 26	OUT	SEGMENT 26 (P26)	(VEE internal pull-down)
80	P50	SEG 27	OUT	SEGMENT 27 (P27)	(VEE internal pull-down)
81	P67	SEG 28	OUT	SEGMENT 28 (P28)	(VEE internal pull-down)
82	P66	SEG 29	OUT	SEGMENT 29 (P29)	(VEE internal pull-down)
83	P65	SEG 30	OUT	SEGMENT 30 (P30)	(VEE internal pull-down)
84	P64	SEG 31	OUT	SEGMENT 31 (P31)	(VEE internal pull-down)
85	P63	SEG 32	OUT	SEGMENT 32 (P32)	(VEE internal pull-down)
86	P62	SEG 33	OUT	SEGMENT 32 (P33)	(VEE internal pull-down)
87	P61	SEG 34	OUT	SEGMENT 34 (P34)	(VEE internal pull-down)
88	P60	SEG 35	OUT	SEGMENT 35 (P35)	(VEE internal pull-down)
89	VEE	– VP	-	P0,P1,P5,P6 pull-down resistor voltage input	[-29V]
90	P107	Audio	A-D IN	Power amplifier sound IN	[0 — VREF]
91	P106	TH	A-D IN	Heat sinking plate temperature detect IN	[0 — VREF]
92	P105	Pro PS	A-D IN	Power voltage detect IN (protection)	[0 — VREF]
93	P104	Fan fe	A-D IN	Air cooling fan voltage detect IN	[0 — VREF]
94	P103	Des	A-D IN	Destination select input (TUNER)	[Pull-up at 10kΩ → VREF]
95	P102	KEY 2	A-D IN	KEY 2 input	[Pull-up at 10kΩ → VREF]
96	P101	KEY 1	A-D IN	KEY 1 input	[Pull-up at 10kΩ → VREF]
97	AVSS	AVss	-	Connected to VSS(GND)	
98	P100	KEY 0	A-D IN	KEY 0 input	[Pull-up at 10kΩ → VREF]
99	VREF	Vref	-	A-D,D-A reference voltage input	[— VCC]
100	AVCC	AVcc	-	Connected to VCC terminal (+5V)	

● KEY INPUT (A-D) PULL UP RESISTOR 10kΩ

Ω	0	+2k	+1.8k	+2.4k	+3.9k	+5.6k	+10k	+24k
V	0 — 0.556	— 1.111	— 1.667	— 2.222	— 2.778	— 3.333	— 3.889	— 4.444
KEY 0 (98pin)	POWER	PRESET/TUNING ∧	PRESET/TUNING ∨	NO KEY	NO KEY	NO KEY	NO KEY	NO KEY
KEY 1 (96pin)	PRESET/BAND	AUTO/MAN'L TIMER	NO KEY	NO KEY	NO KEY	NO KEY	NO KEY	NO KEY
KEY 2 (95pin)	DISPLAY	MEMORY TIME ADJ	NO KEY	NO KEY	NO KEY	NO KEY	NO KEY	NO KEY

● TUNER MARKET SELECT IN (94 pin, A-D) PULL UP RESISTOR 10kΩ

Ω	0	2k	3.9k	6.2k	10k	16k
V	0 — 0.556	— 1.111	— 1.667	— 2.222	— 2.778	— 3.333
Market	R model (50k / 9k)	R model (100k / 10k)	A model	B, G models	U, C models	J model

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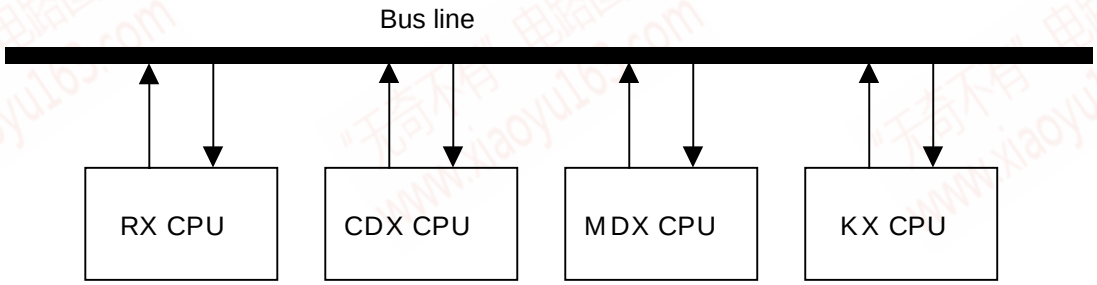
SYSTEM CONTROL

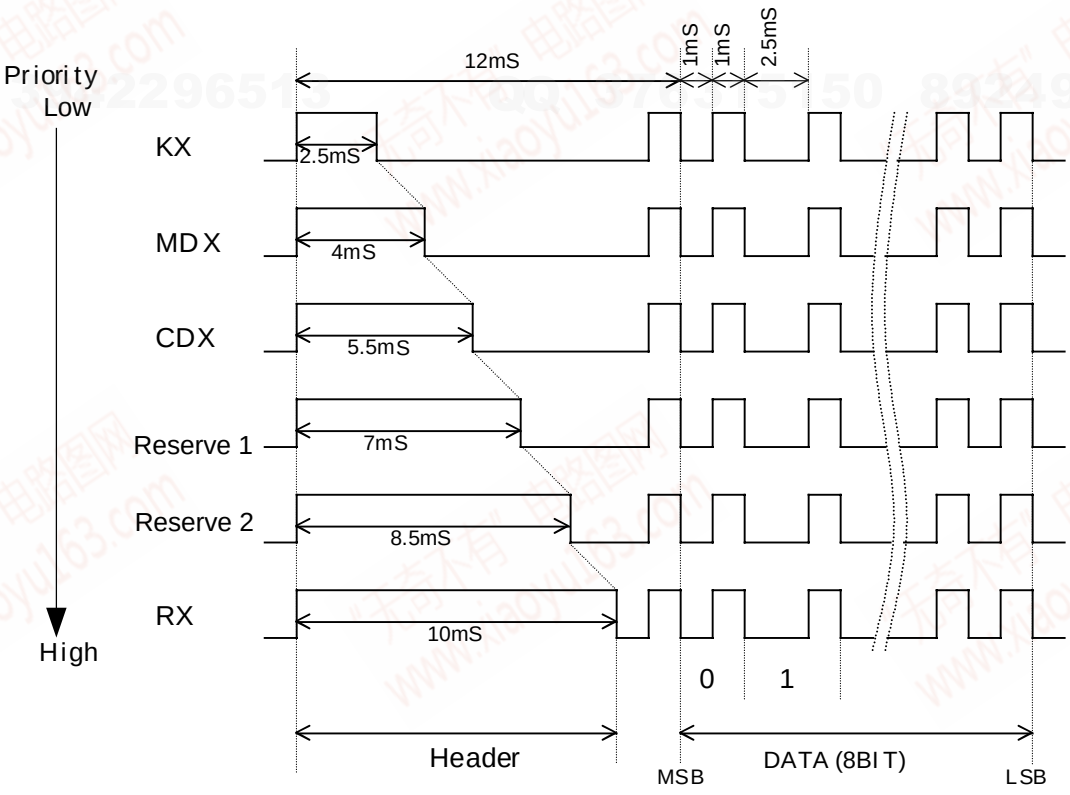
Features

- One bus line controls all the units.
- Units are connected in series, using monaural mini jacks.
- Units can be connected in any order

Description of Operation



Serial Data Format



Note) When transmitting a data following the previous data, leave at least 2mS space between them. (at least 4mS only when transmitting the CD text data)

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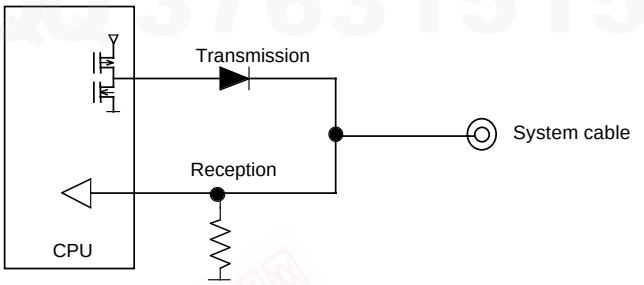
Microprocessor peripheral circuit

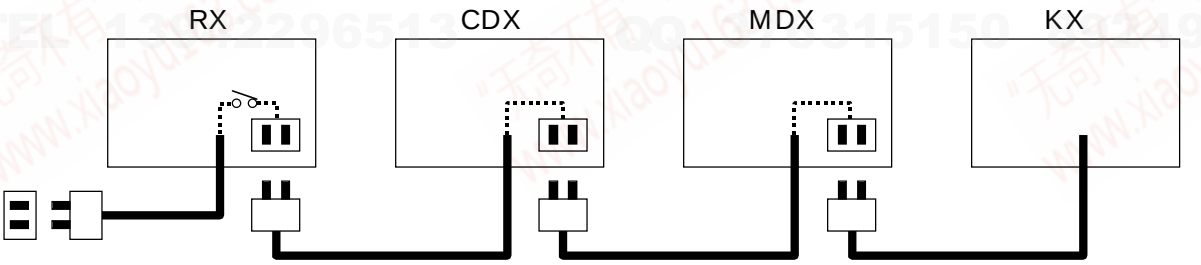


Description of data transmission and reception

① Although there is only 1 bus line, prepare special ports for data transmission and reception at each CPU.
② The bus data consists of a header and data (8 bits). CPU receives and transmits at a 0.5mS or less timer interruption.
③ The header is used to identify the model and to prevent butting by changing the length for each unit.
④ At each CPU, data transmission and reception are carried out independently. Before transmitting the data, be sure to check the reception status. If the data is being received, wait until the data has been received and then transmit the data.
⑤ When the data transmission is completed, each CPU also checks the received data. If the header of the received data does not agree with its own head, the data may have been overlapped by that of the other model. In such case, stop the data transmission and restart it after confirming that the the data transmission of other model has been completed. This means that the unit with a longer header has a higher priority.

Description of main system operation

1) POWER ON/OFF processing [(1) to (4)]



• The power cord of each unit is connected to the AC outlet in series and switched on and off through the RX relay.
• Turning off the RX power switch will turn off the power to other units (primary connection) but turning off the power switch of any other unit will turn off the secondary connection of each unit only (i.e., the microprocessor remains on).
• Each unit has a backup function to save the secondary connection status when unplugged (taking use of a unit alone into consideration)
• The indicators of units are turned on after a dimmer level signal is fed from RX so that they light up simultaneously when the RX power switch is turned on. However, as the indicator of a unit does not light up when the unit is used alone in this setting, the indicator is forced to turn on when 2 seconds have elapsed without a dimmer level signal being fed (and the power for the backup function is turned on). When the CD unit is used alone, the timer play mode is set regardless of the backup function status.
• Make sure that the power off processing of each unit has been completed before turning off the power by using the RX relay.

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2) FUNCTION [(5) to (6)]
• No source other than that selected by the input selector will be reproduced.
• The functions are selected automatically to be suitable for the source to be reproduced.
• Selecting the functions is prohibited during recording.

3) TIMER operation [(7) to (8)]
• TIMER PLAY to start reproduction at a specified time
• TIMER REC to start recocording at a specified time

4) AUTO POWER OFF [(9)]
The RX power is truned OFF when the FUNCTION setting is other than TUNER and AUX and no key operation has been made for half an hour while all the connected units are at stop.

5) AUTO POWER ON [(10)]
If the power of the connected units has been turned off while the RX power is on and when a key involving reproduction is pressed, the power is turned on automatically.

6) CD TEXT compatible
When recording the contents of the CD TEXT compatible CD into an MD in the SYNCHRONOUS or EDIT mode, the text data is recorded as well although limited up to 127 characters of the track name only for SYNCHRONOUS recording, and names of the disc, artist and track for EDIT recording.

7) Dimmer
There are 7 dimmer level settings. The dimmer level data is transmmitted from the receiver when the power is turned on. The dimmer level is “0” when a unit is used alone.

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(1) POWER ON PROCESSING (Receiver)

When the power is turned on at the receiver, the relay of the AC outlet is turned on to supply power to each unit.
Each unit informs the receiver of its status when started (secondary connection status).

RX	CDX	MDX	KX	Remarks
POWER SW ON ↓ AC outlet ON ↓ DIMMER level signal transmitted about 1 second later [DIMM_*]				The indicator of each unit turns on when [DIMM_*] is received but 2 seconds later when the unit is used alone.
	Secondary connection state [STATE_ON] or [STATE_OFF]	Secondary connection state [STATE_ON] or [STATE_OFF]	Secondary connection state [STATE_ON] or [STATE_OFF]	The receiver detects the units being connected when informed of the secondary connection state.

(2)POWER ON PROCESSING (except receiver)

When the power is turned on at a unit other than the receiver, the unit informs the receiver of the status then.

RX	CDX	MDX	KX	Remarks
		POWER SW ON ↓ Secondary connection state [STATE_ON]		The receiver detects the units being connected when informed of the secondary connection state.

(3)POWER OFF PROCESSING (Receiver)

The receiver turns off the AC outlet when the power off processing of each unit has been completed.

RX	CDX	MDX	KX	Remarks
POWER SW OFF [POFF_REQ]				
	Secondary connection state [STATE_ON] or [STATE_OFF]	Secondary connection state [STATE_ON] or [STATE_OFF]	Secondary connection state [STATE_ON] or [STATE_OFF]	The receiver detects the units being connected when informed of the secondary connection state.
	After POWER OFFprocessing [POFF_OK]	After POWER OFFprocessing [POFF_OK]	After POWER OFFprocessing [POFF_OK]	
The relay turns off after confirming [POFF_OK] of all the units being connected.		MD transmits [POFF_OK] after TOC writing has been completed.		

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(4)POWER OFF processing (except receiver)

When the power is turned off at a unit other than the receiver, the unit informs the receiver of the status when the power off processing has been completed.

RX	CDX	MDX	KX	Remarks
	POWER OFF ↓ After POWER OFF processing Secondary connection state [STATE_OFF]			The receiver detects the units being connected when informed of the secondary connection state.
←				

(5)FUNCTION selection

When the RX function is selected, the unit in the PLAY mode will be stopped.

RX	CDX	MDX	KX	Remarks
FUNCTION selection [FUNC_CD] or [FUNC_MD] or [FUNC_TAPE] or [FUNC_TU] or [FUNC_AUX]				When MD or TAPE is in RECORD mode, or in EDIT mode, it is prohibited to select functions.
	↓ Stop when FUNC≠ CD and in PLAY mode [STOP]	↓ Stop when FUNC≠ MD and in PLAY mode [STOP]	↓ Stop when FUNC≠ TAPE and in PLAY mede [STOP]	
←				

(6)AUTO FUNCTION

When each unit is set to the PLAY mode, the receiver selects the function to be suitable for that.

RX	CDX	MDX	KX	Remarks
	PLAY START [PLAY]	PLAY START [PLAY]	PLAY START [PLAY]	
↓ When FUNC≠ PLAY FUNCTION selection [FUNC_CD] or [FUNC_MD] or [FUNC_TAPE] or [FUNC_TU] or [FUNC_AUX]				
↓	↓ Stop when FUNC≠ CD and in PLAY mode [STOP]	↓ Stop when FUNC≠ MD and in PLAY mode [STOP]	↓ Stop when FUNC≠ TAPE and in PLAY mode [STOP]	Same function as (5) FUNCTION selection.
←				

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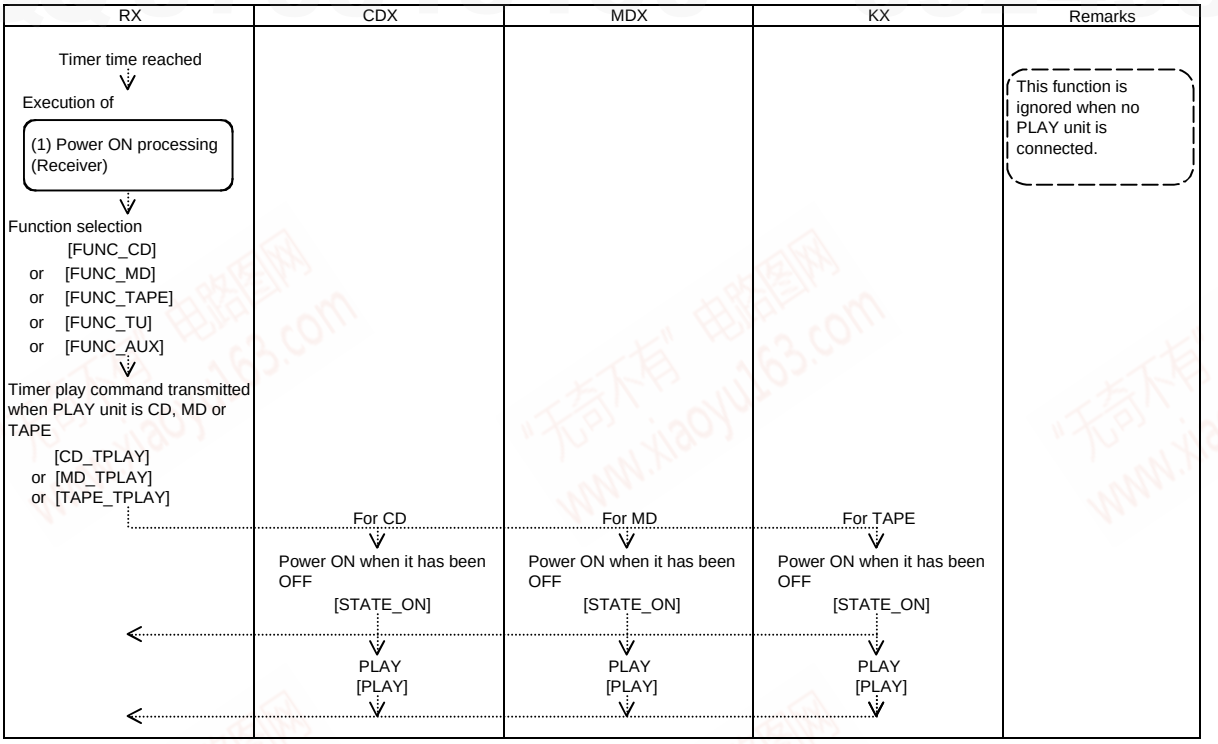
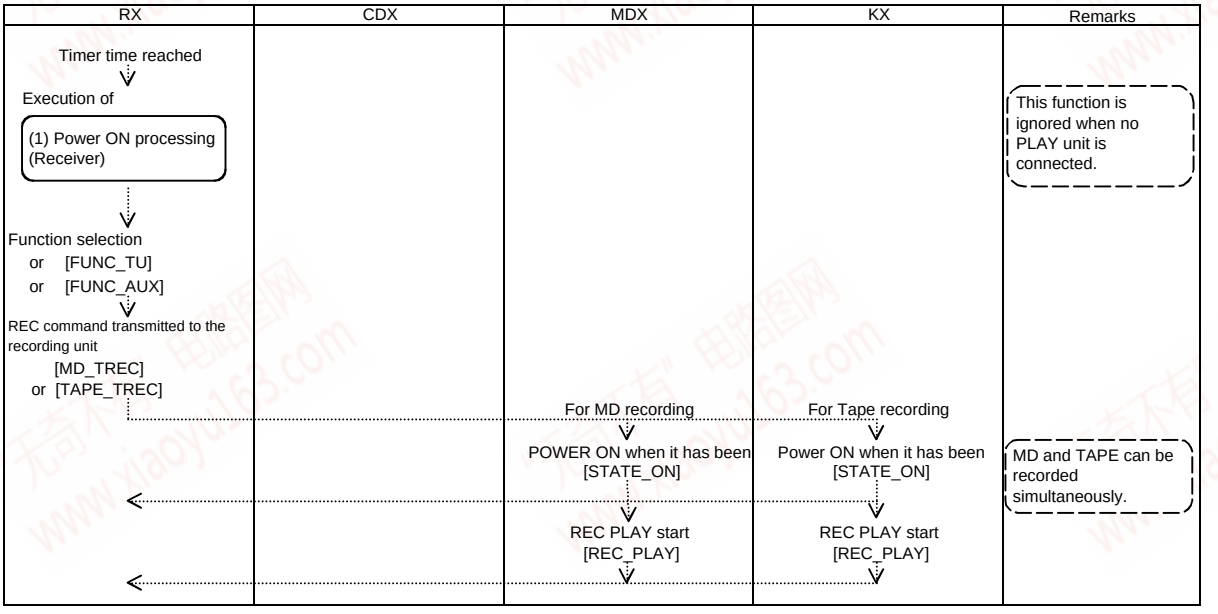
(7)TIMER PLAY

Timer play by built-in timer



(8)TIMER REC

Timer recording by built-in timer



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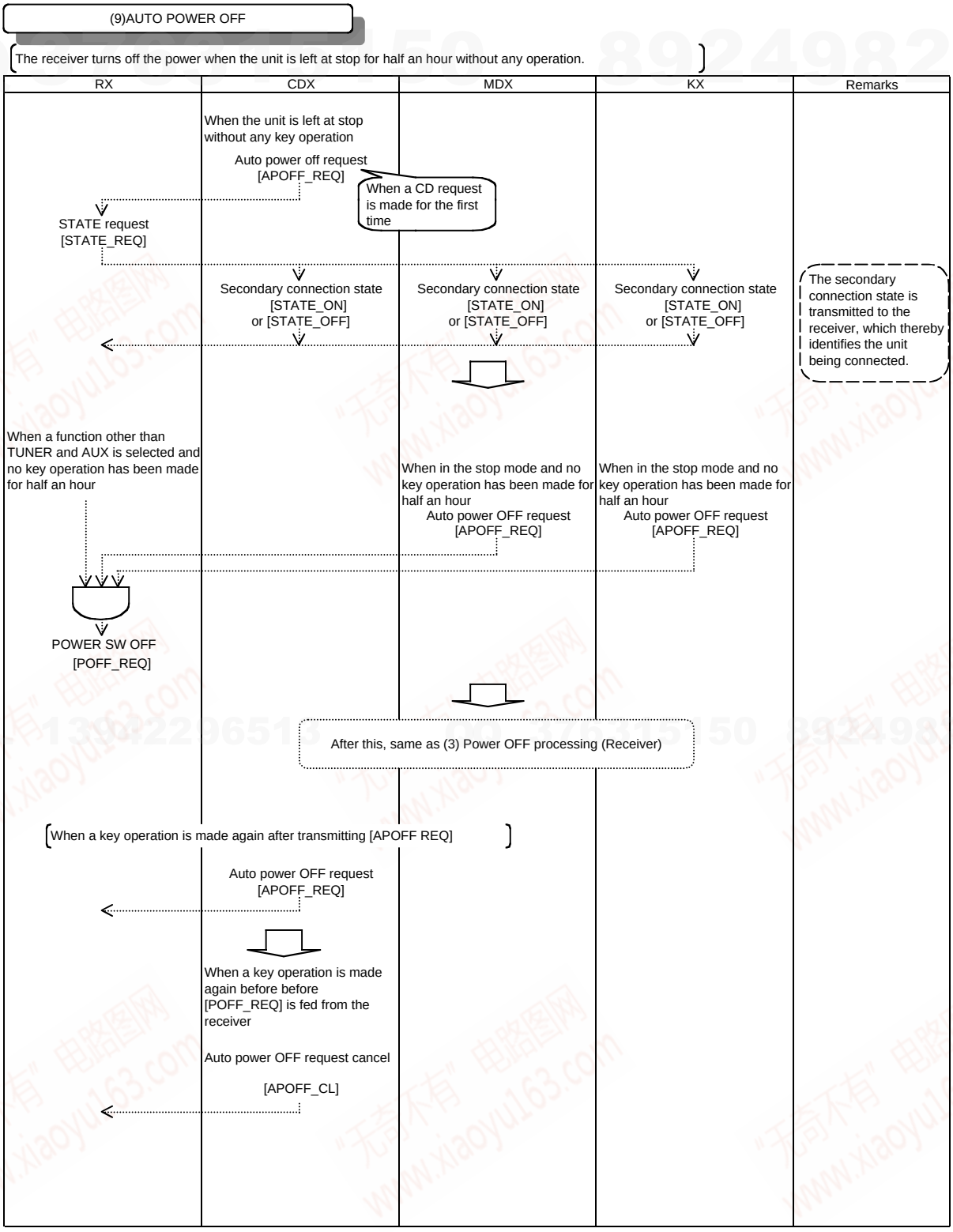
(9)AUTO POWER OFF
The receiver turns off the power when the unit is left at stop for half an hour without any operation.
RX
CDX
MDX
KX
Remarks
When the unit is left at stop without any key operation
Auto power off request [APOFF_REQ]
When a CD request is made for the first time
STATE request [STATE_REQ]
Secondary connection state [STATE_ON] or [STATE_OFF]
Secondary connection state [STATE_ON] or [STATE_OFF]
Secondary connection state [STATE_ON] or [STATE_OFF]
The secondary connection state is transmitted to the receiver, which thereby identifies the unit being connected.
When a function other than TUNER and AUX is selected and no key operation has been made for half an hour
When in the stop mode and no key operation has been made for half an hour
Auto power OFF request [APOFF_REQ]
When in the stop mode and no key operation has been made for half an hour
Auto power OFF request [APOFF_REQ]
POWER SW OFF [POFF_REQ]
After this, same as (3) Power OFF processing (Receiver)
When a key operation is made again after transmitting [APOFF REQ]
Auto power OFF request [APOFF_REQ]
When a key operation is made again before before [POFF_REQ] is fed from the receiver
Auto power OFF request cancel
[APOFF_CL]

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(10)AUTO POWER ON

Function to turn ON the power without using the power switch on the unit other than the receiver

RX	CDX	MDX	KX	Remarks
	Auto power ON applicable key input ↓ When in the power OFF state Secondary connection state [STATE_ON] ↓ Operation according to the input key	Auto power ON applicable key input ↓ When in the power OFF state Secondary connection state [STATE_ON] ↓ Operation according to the input key	Auto power ON applicable key input ↓ When in the power OFF state Secondary connection state [STATE_ON] ↓ Operation according to the input key	

System Control Bus Data Table

FUNCTION		RX	CODE	CDX	CODE	MDX	CODE	KX	CODE
Secondary connection ON				STATE_ON	01	STATE_ON	01	STATE_ON	01
Secondary cary connection OFF				STATE_OFF	02	STATE_OFF	02	STATE_OFF	02
Power OFF request		POFF_REQ	D0						
End of power OFF processing				POFF_OK	03	POFF_OK	03	POFF_OK	03
STATE request		STATE_REQ	D1						
Auto power OFF request				APOFF_REQ	04	APOFF_REQ	04	APOFF_REQ	04
Auto power OFF cancel				APOFF_CL	05	APOFF_CL	05	APOFF_CL	05
Timer operation	Timer PLAY request(CD)	CD_TPLAY	D2						
	Timer PLAY request(MD)	MD_TPLAY	D3						
	Timer PLAY request(TAPE)	TAPE_TPLAY	D4						
	Rimer REC request(MD)	MD_TREC	D5						
	Timer REC request(TAPE)	TAPE_TREC	D6						
FUNCTION selection		FUNC_CD	D7						
		FUNC_MD	D8						
		FUNC_TAPE	D9						
		FUNC_TU	DA						
		FUNC_AUX	DB						
PLAY operation				PLAY	06	PLAY	06	PLAY	06
STOP operation				STOP	07	STOP	07	STOP	07
PAUSE				PAUSE	08	PAUSE	08		
REC PAUSE operation						REC_PAUSE	09	REC_PAUSE	09
REC PLAY operation						REC_PLAY	0A	REC_PLAY	0A
Dimmer level	0	DIMM_0	E0						
	-1	DIMM_1	E1						
	-2	DIMM_2	E2						
	-3	DIMM_3	E3						
	-4	DIMM_4	E4						
	-5	DIMM_5	E5						
	-6	DIMM_6	E6						
EDIT related operation	EDIT mode	EDIT_C→T	EA						
		EDIT(TR1)_C→T	EB						
		EDIT_C→M	EC						
		EDIT(TR1)_C→M	ED						
		EDIT_M→T	EE						
		EDIT_T→M	EF						
	Track no change			TNO_CHG	0B	TNO_CHG	0B		
	"A" side tape end							TAPE_END	0B
	CD open wait			OPEN_WAIT	0C				
CD text related operation	Disc name end			DNAME_STAT	10				
	Disc name end			DNAME_END	11				
	Artist name start			ANAME_STAT	12				
	Artist name end			ANAME_END	13				
	Track name start			TNAME_STAT	14				
	Track name end			TNAME_END	15				
	Text data protect			PROTECT	16				
	Reception OK					GET_OK	0C		
	Reception NG					GET_NG	0D		
	Text data			ASCII_CODE	20 | 7F				
	Number of characters(0 to127)			COUNT	80 | FF				

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Function		RX	CODE	CDX	CODE	MDX	CODE	KX	CODE
Remote control	CD	CD_STOP	80						
		CD_PLAY/PAUSE	81						
		CD_EJECT	82						
		CD_SKIP+	83						
		CD_SKIP-	84						
		SEARCH+	85						
		SEARCH-	86						
		SEACH_END	87						
		CD_RANDAM	88						
		CD_TIME	89						
		CD_PRG	8A						
		CD_RPT	8B						
		TAPE	8C						
		PEAK SEARCH	8D						
		CD_0	90						
		CD_1	91						
		CD_2	92						
		CD_3	93						
		CD_4	94						
		CD_5	95						
		CD_6	96						
		CD_7	97						
		CD_8	98						
		CD_9	99						
		CD_10	9A						
	MD	MD_STOP	A0						
		MD_PLAY/PAUSE	A1						
		MD_EJECT	A2						
		MD_SKIP+	A3						
		MD_SKIP-	A4						
		SEARCH+	A5						
		SEARCH-	A6						
		SEACH_END	A7						
		MD_RANDAM	A8						
		MD_TIME	A9						
		MD_PRG	AA						
		MD_RPT	AB						
		MD_REC PAUSE	AC						
		MD_0	B0						
		MD_1	B1						
		MD_2	B2						
		MD_3	B3						
		MD_4	B4						
		MD_5	B5						
		MD_6	B6						
		MD_7	B7						
		MD_8	B8						
		MD_9	B9						
		MD_10	BA						
		MD_+100	BB						
	TAPE	TAPE_STOP	C0						
		TAPE_PLAY	C1						
		TAPE_EJECT	C2						
		TAPE_FF	C3						
		TAPE_REW	C4						
		TAPE_PAUSE	C5						
		TAPE_DIR	C6						

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Reception status of operation switches during recording

(*=AUX or TUNER)

Unit	SW	EDIT or EDIT(TR-1) RECORDING				SYNCHRONOUS or MANUAL RECORDING							
		C→T	C→M	M→T	T→M	C→T	C→M	M→T	T→M	C→T,M	*→M	*→T	*→T,M
RX	POWER	O	O	O	O	O	O	O	O	O	O	O	O
	FUNCTION	X	X	X	X	X	X	X	X	X	X	X	X
CD	POWER	O	O	O	O	O	O	O	O	O	O	O	O
	EJECT	X	X	O	O	O	O	O	O	O	O	O	O
	PLAY	X	X	X	X	O	O	X	X	O	X	X	X
	STOP	O	O	X	X	O	O	X	X	O	X	X	X
	SKIP	X	X	X	X	O	O	X	X	O	X	X	X
	SEARCH	X	X	X	X	O	O	X	X	O	X	X	X
MD	POWER	O	O	O	O	O	O	O	O	O	O	O	O
	EJECT	O	X	X	X	O	O	O	O	O	O	O	O
	PLAY	X	X	X	X	X	X	O	X	X	X	X	X
	STOP	X	O	O	O	X	O	O	O	O	O	X	O
	SKIP	X	X	X	X	X	X	O	X	X	X	X	X
	SEARCH	X	X	X	X	X	X	O	X	X	X	X	X
	REC	X	X	X	X	X	O	X	O	O	O	X	O
TAPE	POWER	O	O	O	O	O	O	O	O	O	O	O	O
	EJECT	X	O	X	X	O	O	O	O	O	O	O	O
	PLAY	X	X	X	X	X	X	X	O	X	X	X	X
	STOP	O	O	O	O	O	O	O	O	O	O	O	O
	FF/REW	X	O	X	X	O	O	O	O	O	O	O	O
	REC	X	X	X	X	O	X	O	X	O	X	O	O

Principle of switch rec operation reception

- The POWER SW has priority regardless of any other conditions.
- During EDIT recording, no switch operation other than discontinuing the EDIT function (STOP SW of recording and reproduction units) is received. However, if it is clear that the switch operation would not affect the EDIT function, it will be accepted.
- During SYNCHRONOUS or MANUAL recording, the switch operation of the recording and reproduction units is accepted but switch operation of other units that would affect recording are not accepted.

AUTO POWER ON RECEPTION SW

(This switch can turn on the power instead of the POWER SW when the secondary switch has been turned off.)

Unit	SW
CD	EJECT
	PLAY
MD	EJECT
	PLAY
TAPE	EJECT
	PLAY

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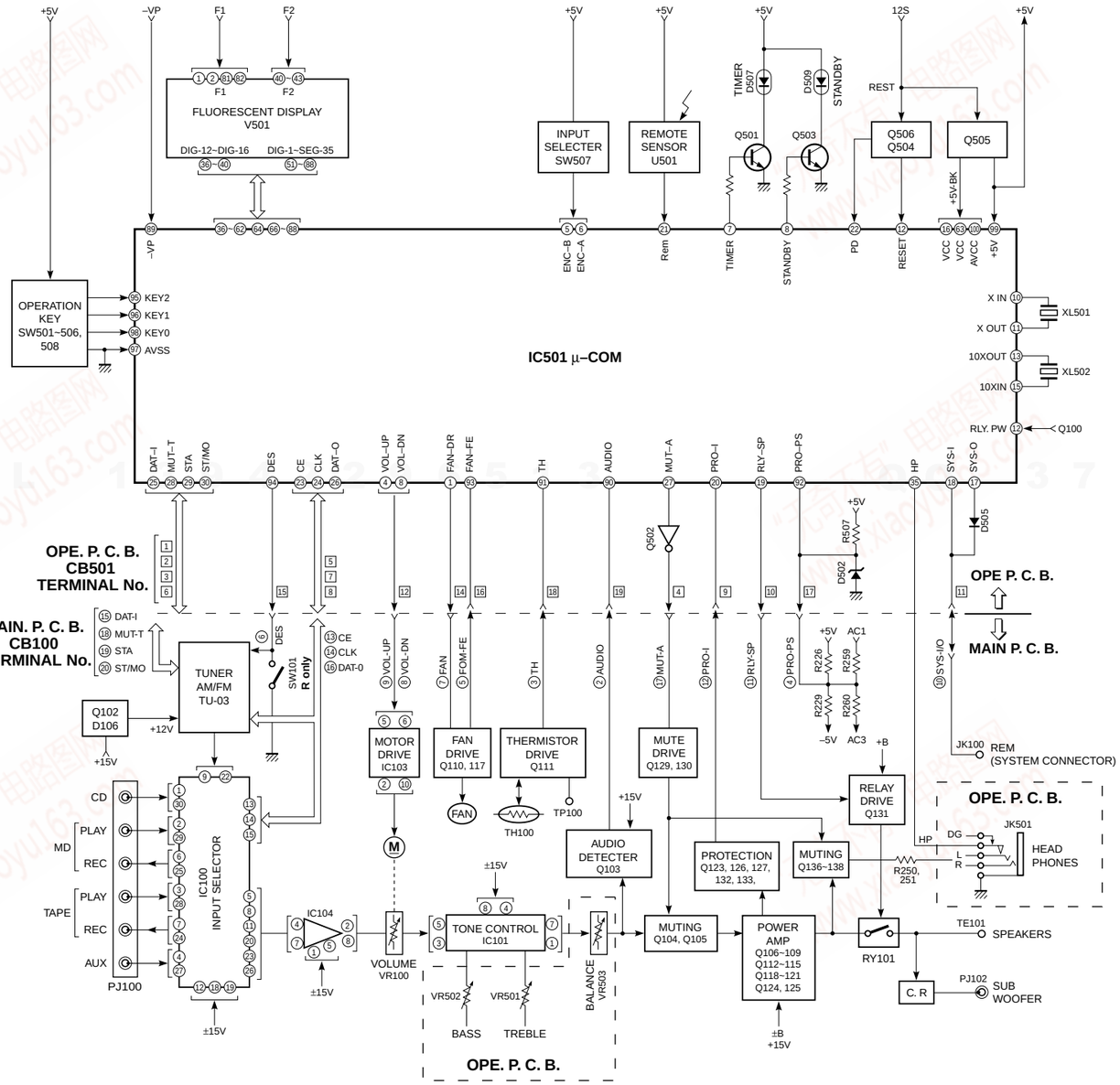
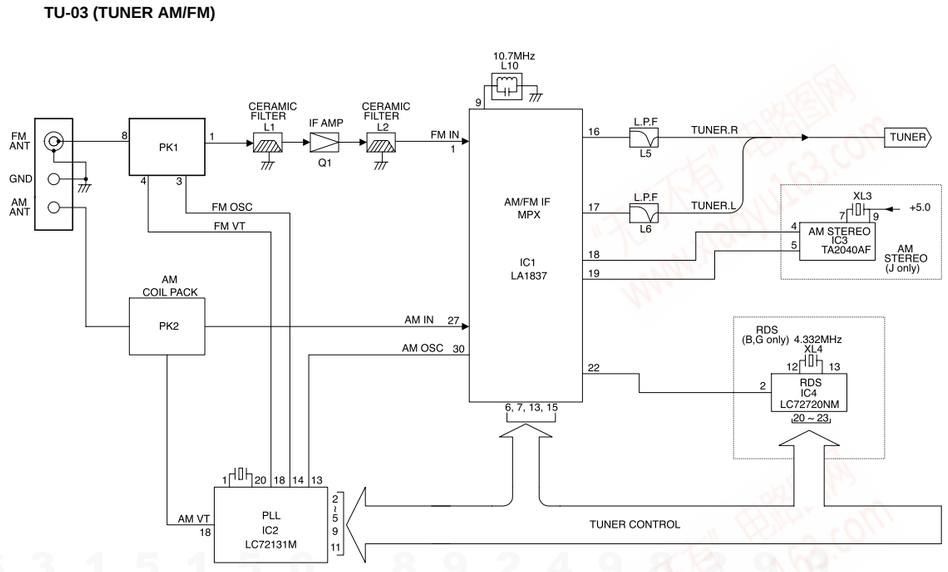
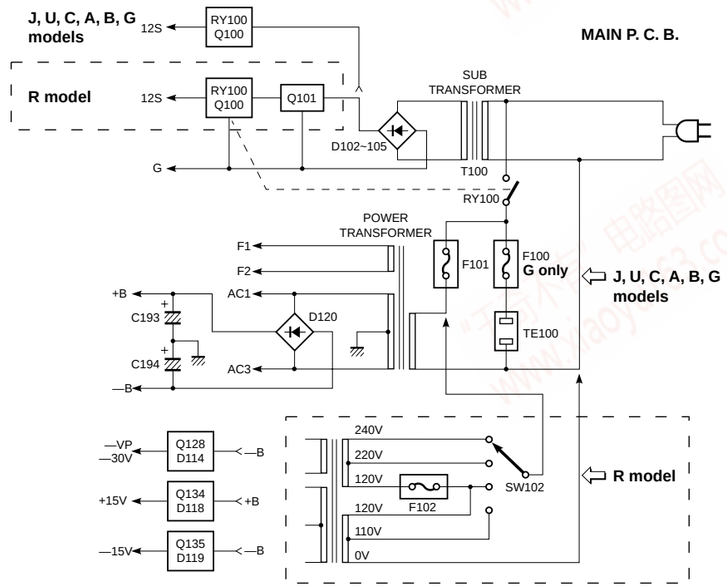
■ BLOCK DIAGRAM







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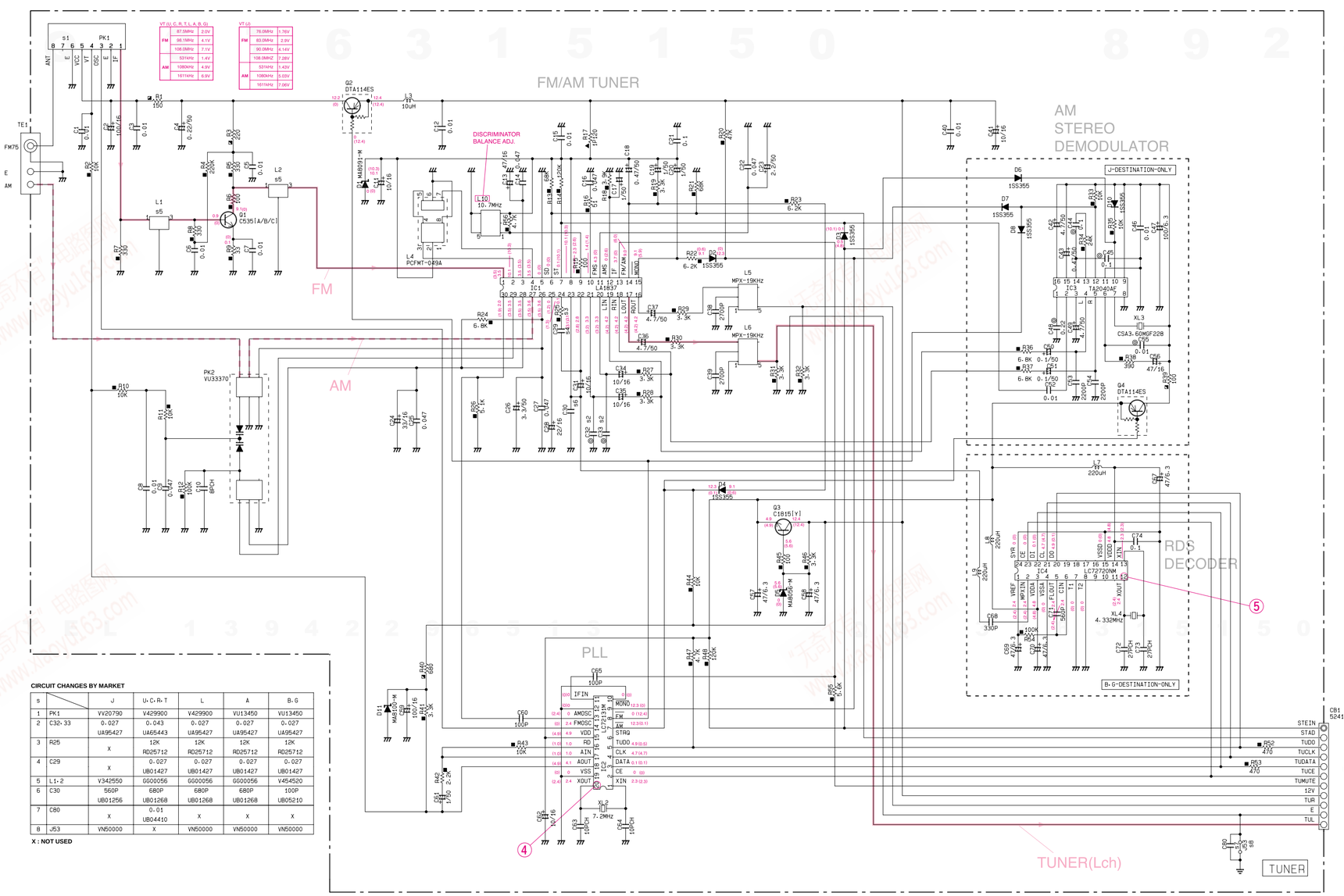
■ SCHEMATIC DIAGRAM (TUNER)

Each voltage represents the voltage when receiving FM (stereo) signal and the voltage in the parentheses ( ) is the voltage when receiving AM signal.



CIRCUIT CHANGES BY MARKET

S		J	U.C.R.T	L	A	B.G
1	PK1	VV20790	V429900	V429900	VU13450	VU13450
2	C32, 33	0.027 UA95427	0.043 UA65443	0.027 UA95427	0.027 UA95427	0.027 UA95427
3	R25	X	12K RD25712	12K RD25712	12K RD25712	12K RD25712
4	C29	X	0.027 UB01427	0.027 UB01427	0.027 UB01427	0.027 UB01427
5	L1, 2	V342550	G600056	G600056	G600056	V454520
6	C30	560P UB01256	680P UB01268	680P UB01268	680P UB01268	100P UB05210
7	C80	X	0.01 UB04410	X	X	X
8	J53	VN50000	X	VN50000	VN50000	VN50000

X : NOT USED

RESISTOR

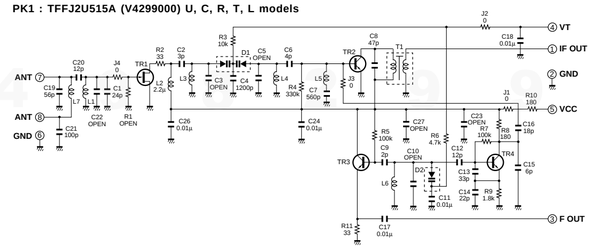
REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
⊘	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
◪	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊘	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

CAPACITOR

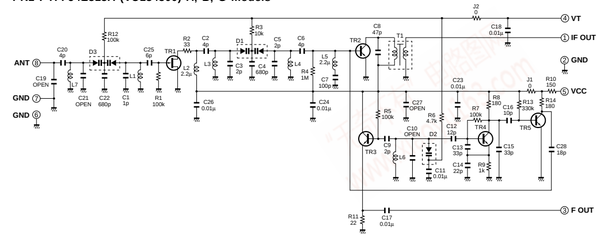
REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
◉	CERAMIC TUBULAR CAPACITOR
Ⓜ	POLYESTER FILM CAPACITOR
○	POLYSTYRENE FILM CAPACITOR
Ⓘ	MICA CAPACITOR
Ⓟ	POLYPROPYLENE FILM CAPACITOR
◍	SEMICONDUCTIVE CERAMIC CAPACITOR

NOTICE (model)
(J)····· JAPANESE
(U)····· U.S.A
(C)····· CANADIAN
(R)····· GENERAL
(A)····· AUSTRALIAN
(B)····· BRITISH
(G)····· EUROPEAN
(T)····· CHINA
(L)····· SINGAPORE

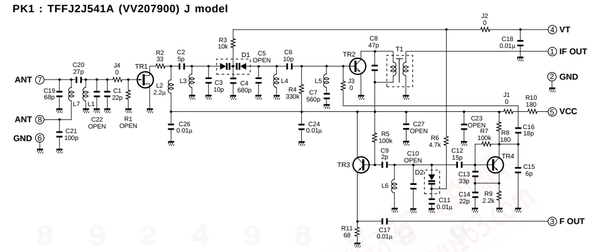
PK1 : TFFJ2U515A (V4299000) U, C, R, T, L models



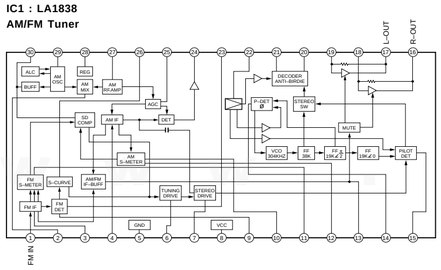
PK1 : TFFJ4E515A (VU134500) A, B, G models



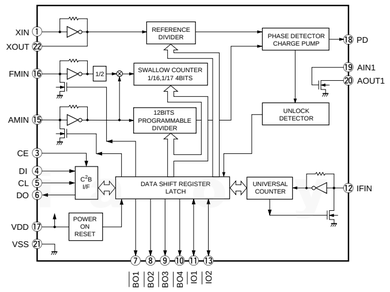
PK1 : TFFJ2J541A (VV207900) J model



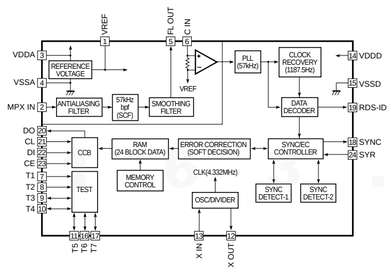
IC1 : LA1838
AM/FM Tuner



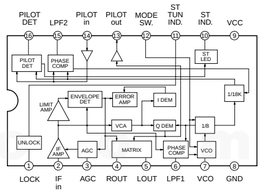
IC2 : LC72131M
PLL Controller



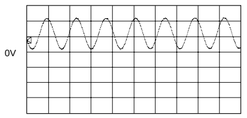
IC4 : LC72720NM
RDS Decoder & Controller



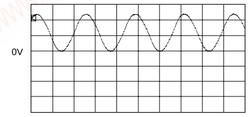
IC3 : TA2040AF
AM Stereo Demodulator



Point ④ (Pin20 of IC2)
V : 2V/div H : 0.1 µsec/div
DC range 1 : 1 probe



Point ⑤ (Pin12 of IC4)
V : 2V/div H : 0.1 µsec/div
DC range 1 : 1 probe



* All voltage are measured with a 10MΩ/V DC electric volt meter.
* Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
* Schematic diagram is subject to change without notice.

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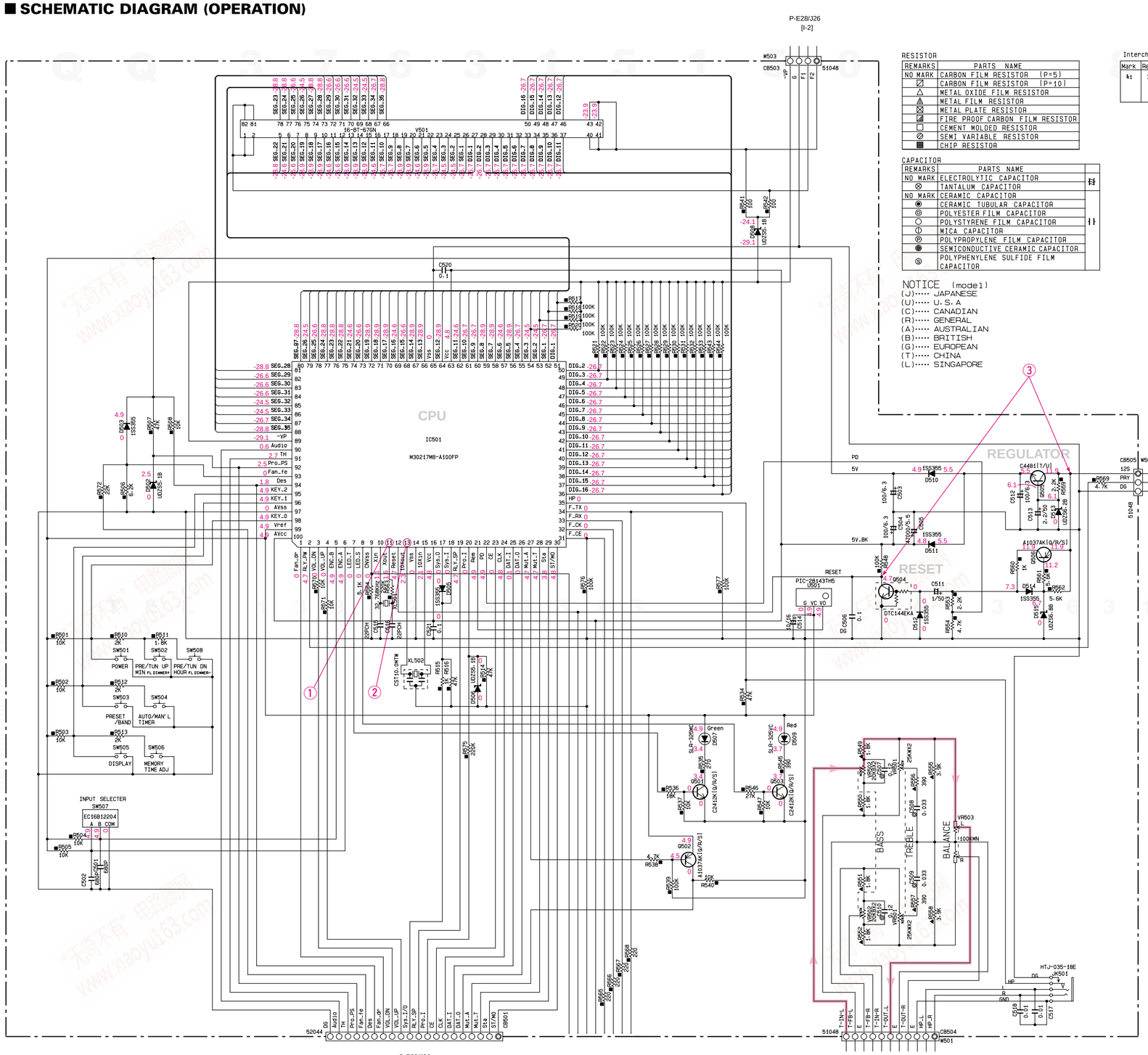
■ SCHEMATIC DIAGRAM (OPERATION)



RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
☑	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
◪	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊘	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME	
NO MARK	ELECTROLYTIC CAPACITOR	⫼
⊗	TANTALUM CAPACITOR	⫼
NO MARK	CERAMIC CAPACITOR	⫻
◉	CERAMIC TUBULAR CAPACITOR	⫻
◎	POLYESTER FILM CAPACITOR	⫻
○	POLYSTYRENE FILM CAPACITOR	⫻
①	MICA CAPACITOR	⫻
ⓟ	POLYPROPYLENE FILM CAPACITOR	⫻
●	SEMICONDUCTIVE CERAMIC CAPACITOR	⫻
ⓢ	POLYPHENYLENE SULFIDE FILM CAPACITOR	⫻

NOTICE (model)
(J)····· JAPANESE
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(R)····· GENERAL
(A)····· AUSTRALIAN
(B)····· BRITISH
(G)····· EUROPEAN
(T)····· CHINA
(L)····· SINGAPORE

Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
&t	IC502	S-29190AFJA S-29290AFJA

● V501 : 16-BT-67GN (V3579300)

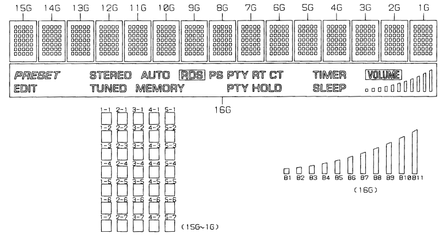
● PIN CONNECTION

PIN NO.	41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
CONNECTION	FF NN 1G 9G 8G 7G 6G 5G 4G 3G 2G 1G PP FF 22 PP GG 12 34 56 78 90 12 34 56 78 90 12 PP 11

PIN NO.	42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82
CONNECTION	FF NN 23 45 67 89 AB CD EF GH IJ KL MN NN NN NN NN NN NN NN NN NN NN PP PP PP PP PP PP PP PP PP NN FF 22 PP GG XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX PP 11

NOTE 1) F1, F2 ..... Filament
2) NP ..... No pin
3) NX ..... No extend pin
4) P1~P35 ..... Datum Line
5) 1G~16G ..... Grid
6) IC ..... Internal connection
7) Pin No.37 and 51 are connected internally.

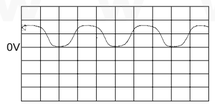
● GRID ASSIGNMENT


1SG 14G 13G 12G 11G 10G 9G 8G 7G 6G 5G 4G 3G 2G 1G
PRESET EDIT
STEREO AUTO PDS PS PTY RT CT TIMER VOLUME
TUNED MEMORY PTY HOLD SLEEP
16G
(15G~1G)
(16G)

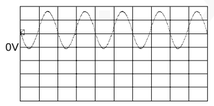
● ANODE CONNECTION

	16G	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	PRESET	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1
P2	STEREO	2-1	2-1	2-1	2-1	2-1	2-1	2-1	2-1	2-1	2-1	2-1	2-1	2-1	2-1	2-1
P3	TUNED	3-1	3-1	3-1	3-1	3-1	3-1	3-1	3-1	3-1	3-1	3-1	3-1	3-1	3-1	3-1
P4	AUTO	4-1	4-1	4-1	4-1	4-1	4-1	4-1	4-1	4-1	4-1	4-1	4-1	4-1	4-1	4-1
P5	MEMORY	5-1	5-1	5-1	5-1	5-1	5-1	5-1	5-1	5-1	5-1	5-1	5-1	5-1	5-1	5-1
P6	PDS	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2
P7	PS	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2
P8	PTY	3-2	3-2	3-2	3-2	3-2	3-2	3-2	3-2	3-2	3-2	3-2	3-2	3-2	3-2	3-2
P9	RT	4-2	4-2	4-2	4-2	4-2	4-2	4-2	4-2	4-2	4-2	4-2	4-2	4-2	4-2	4-2
P10	CT	5-2	5-2	5-2	5-2	5-2	5-2	5-2	5-2	5-2	5-2	5-2	5-2	5-2	5-2	5-2
P11	PTY HOLD	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3
P12	TIMER	2-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3
P13	SLEEP	3-3	3-3	3-3	3-3	3-3	3-3	3-3	3-3	3-3	3-3	3-3	3-3	3-3	3-3	3-3
P14	EDIT	4-3	4-3	4-3	4-3	4-3	4-3	4-3	4-3	4-3	4-3	4-3	4-3	4-3	4-3	4-3
P15	–	5-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3
P16	–	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4
P17	B1	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4
P18	B2	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4
P19	B3	4-4	4-4	4-4	4-4	4-4	4-4	4-4	4-4	4-4	4-4	4-4	4-4	4-4	4-4	4-4
P20	B4	5-4	5-4	5-4	5-4	5-4	5-4	5-4	5-4	5-4	5-4	5-4	5-4	5-4	5-4	5-4
P21	B5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5
P22	B6	2-5	2-5	2-5	2-5	2-5	2-5	2-5	2-5	2-5	2-5	2-5	2-5	2-5	2-5	2-5
P23	B7	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5
P24	B8	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5
P25	B9	5-5	5-5	5-5	5-5	5-5	5-5	5-5	5-5	5-5	5-5	5-5	5-5	5-5	5-5	5-5
P26	B10	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-6
P27	B11	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6
P28	VOLUME	3-6	3-6	3-6	3-6	3-6	3-6	3-6	3-6	3-6	3-6	3-6	3-6	3-6	3-6	3-6
P29	–	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6
P30	–	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6
P31	–	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7
P32	–	2-7	2-7	2-7	2-7	2-7	2-7	2-7	2-7	2-7	2-7	2-7	2-7	2-7	2-7	2-7
P33	–	3-7	3-7	3-7	3-7	3-7	3-7	3-7	3-7	3-7	3-7	3-7	3-7	3-7	3-7	3-7
P34	–	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7
P35	–	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7

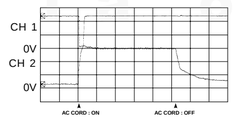
Point ① (Pin 11 of IC501)
V : 2V/div, H : 10μsec/div
DC, 1 : 1 probe



Point ② (Pin 13 of IC501)
V : 2V/div, H : 50nsec/div
DC, 1 : 1 probe



Point ③
CH 1 : Collector of Q504
CH 2 : Collector of Q505
V : 2V/div (CH 1)
V : 5V/div (CH 2)
DC, 1 : 1 probe, H : 0.5sec/div



* All voltage are measured with a 10MΩ/V DC electric volt meter.
* Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
* Schematic diagram is subject to change without notice.

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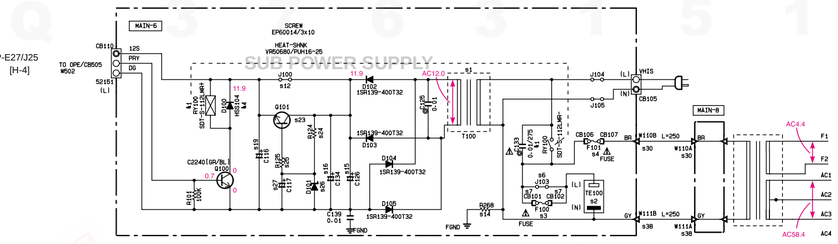
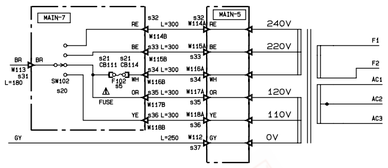
■ SCHEMATIC DIAGRAM (MAIN)





RESISTOR

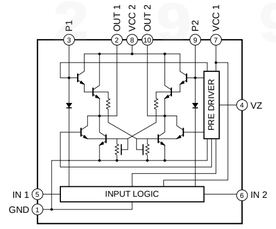
REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
☑	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
◪	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊘	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

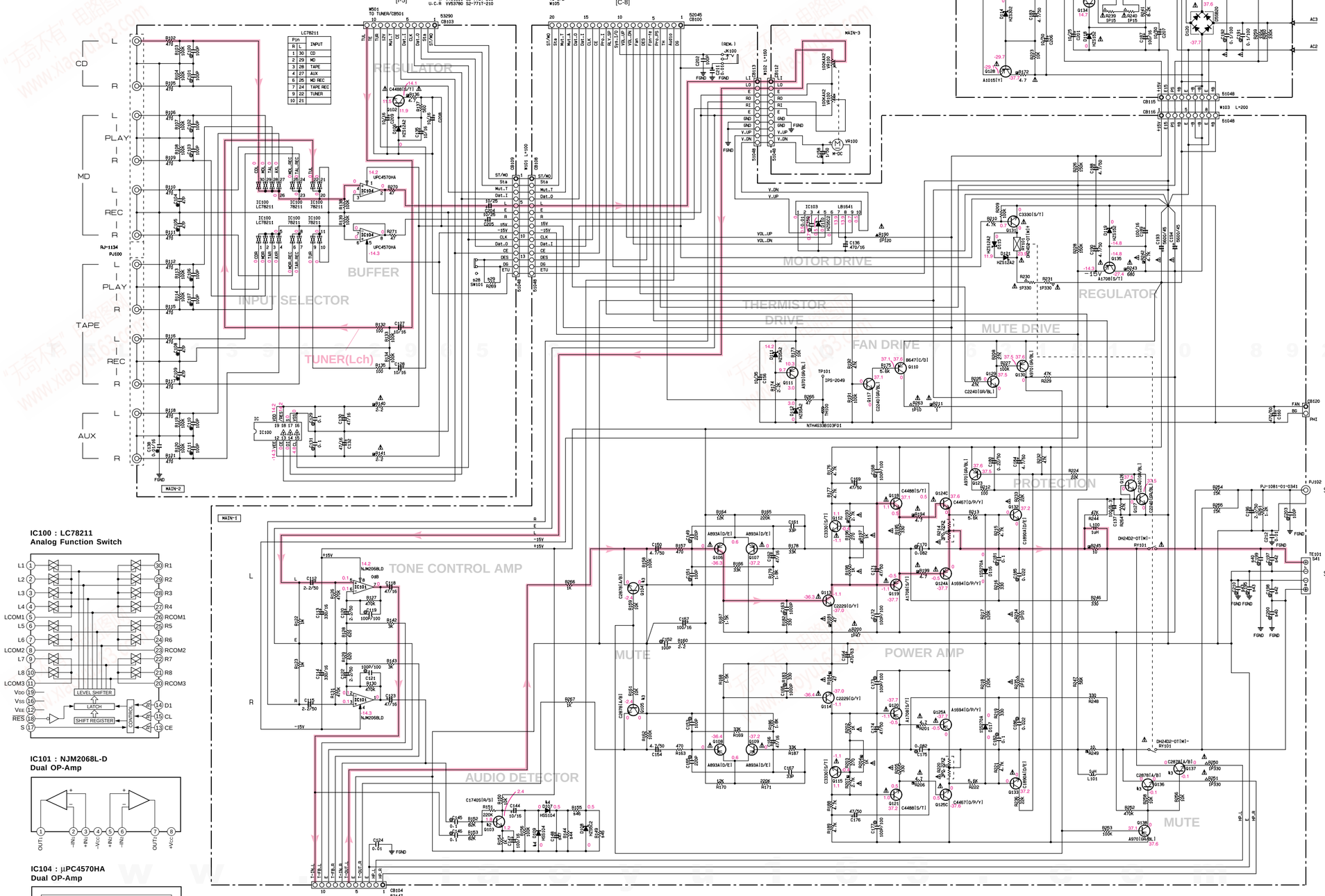
CAPACITOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
◉	CERAMIC TUBULAR CAPACITOR
Ⓜ	POLYESTER FILM CAPACITOR
Ⓢ	POLYSTYRENE FILM CAPACITOR
●	SEMICONDUCTIVE CERAMIC CAPACITOR
Ⓟ	POLYPROPYLENE FILM CAPACITOR
Ⓖ	POLYPHENYLENE SULFIDE FILM CAPACITOR

NOTICE (model)
(J)..... JAPANESE
(U)..... U.S.A
(C)..... CANADIAN
(R)..... GENERAL
(A)..... AUSTRALIAN
(B)..... BRITISH
(G)..... EUROPEAN
(T)..... CHINA
(L)..... SINGAPORE

IC103 : LB1641
Motor Driver

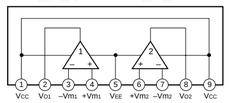




IC100 : LC78211
Analog Function Switch

IC101 : NJM2068L-D
Dual OP-Amp

IC104 : μPC4570HA
Dual OP-Amp



CIRCUIT CHANGES BY MARKET

		J	U-C	R	A	B	G
s1	T100	XV442	XV443	XC082	XC084	XC084	XC084
s2	TE100	VV53780	VV53780	VV53780	VY91500	VU54330	VV53740
s3	F100	X	X	X	X	X	VT94290 T2.5AH250V
s4	F101	VS82290 4A/125V	VS82290 4A/125V	VS82290 4A/125V	KB00068 T1.25AL250V	KB00068 T1.25AL250V	KB00068 T1.25AL250V
s5	F102	X	X	KB00068 T1.25AL250V	X	X	X
s6	J103	0	0	0	0	0	X
s7	CB101-102	X	X	X	X	X	VP20650
s8							
s9							
s10							
s11							
s12	J100	0	0	X	0	0	0
s13							
s14	R268	X	HG30922 1/2P2-2M	X	X	X	X
s15	C126	UR84833 330/25	UR84833 330/25	X	UR84833 330/25	UR84833 330/25	UR84833 330/25
s16	C134	X	X	UR87833 330/63	X	X	X
s17							
s18							
s19	C116	UR84833 330/25	UR84833 330/25	UR83810 100/16	UR84833 330/25	UR84833 330/25	UR84833 330/25
s20	SW102	X	X	VG30810	X	X	X
s21	CB111-114	X	X	VP20650	X	X	X
s22							
s23	G101	X	X	VP51080 2SD2396(J/K)	X	X	X
s24	R124	X	X	HF45718 18K	X	X	X
s25	R125	X	X	HF45610 100	X	X	X
s26	D101	X	X	VK07550 HZS12A2	X	X	X
s27	C117	X	X	UR83710 10/16	X	X	X
s28	SW101	X	X	V362430	X	X	X
s29	R269	16K HF45716	10K HF45710	2K HF45620	3.9K HF45639	6.2K HF45662	6.2K HF45662
s30	W110	MH01030	MH01030	X	MH01030	MH01030	MH01030
s31	W113	X	X	MH01025	X	X	X
s32	W114	X	X	MH02030	X	X	X
s33	W115	X	X	MH06030	X	X	X
s34	W116	X	X	MH09030	X	X	X
s35	W117	X	X	MH03030	X	X	X
s36	W118	X	X	MH04030	X	X	X
s37	W112	X	X	MH08025	X	X	X
s38	W111	MH08025	MH08025	X	MH08025	MH08025	MH08025
s39							
s40	C199-200	X	X	X	X	UA95347 4700P	UA95347 4700P
s41	TE101	VY69630	VY69630	VY69630	VY69640	VY69640	VY69640
s42	C197.198	X	X	X	UA95410 0.01	UA95410 0.01	UA95410 0.01
s43	C195-210	X	X	X	VE32600 0.1	VE32600 0.1	VE32600 0.1
s44	R144	X	X	HF45810 100K	HF45810 100K	HF45810 100K	HF45810 100K
s45	R149	HF45768 68K	HF45682 8.2K	HF45682 8.2K	HF45682 8.2K	HF45682 8.2K	HF45682 8.2K
s46	R155	HF45810 100K	HF45610 1K	HF45610 1K	HF45610 1K	HF45610 1K	HF45610 1K
s47	C148	UR86647 4.7/50	UR86622 2.2/50	UR86622 2.2/50	UR86622 2.2/50	UR86622 2.2/50	UR86622 2.2/50

O : USED
X : NOT USED
Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
k1	RY100	SDT-S-112LMR DG1201-01WIII ALK5321
k2	Q103	2SC1740S[R/S] 2SC2603[E/F]
k3	Q104.105.136.137	2SC2878[A/B] 2SD1915F[S/T]
k4	D100.107.109	HSS104 1SS133 1SS176
k5		

* All voltage are measured with a 10MΩ/V DC electric volt meter.
* Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
* Schematic diagram is subject to change without notice.

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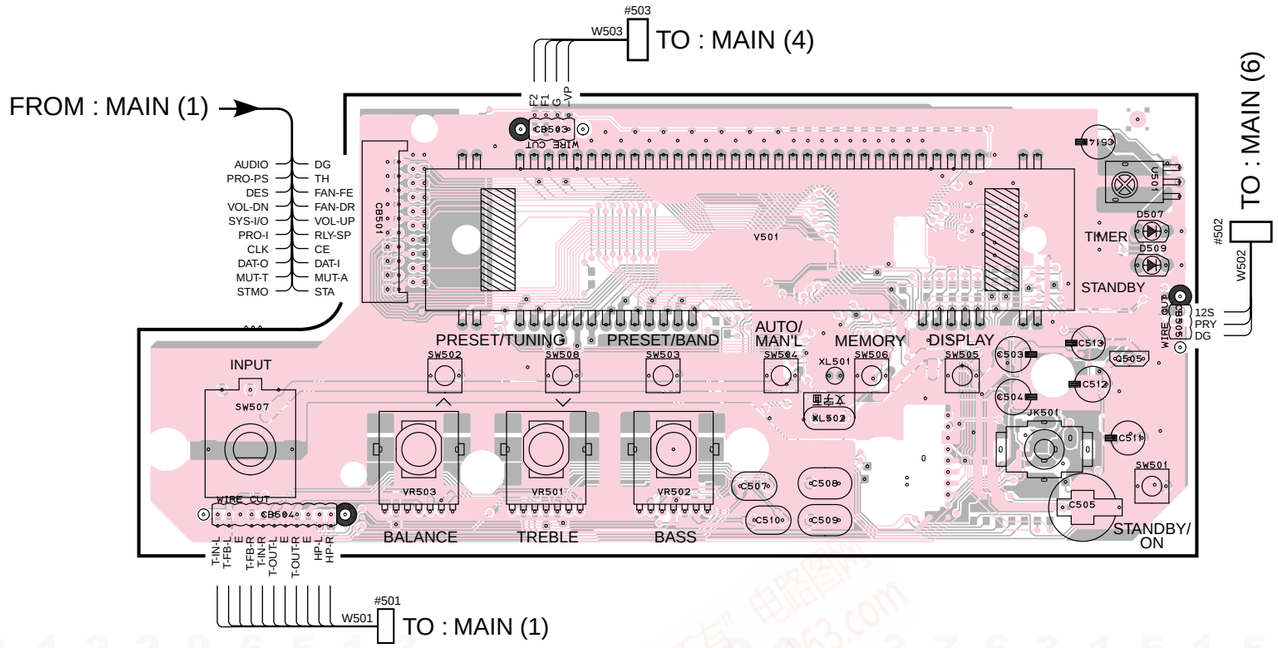
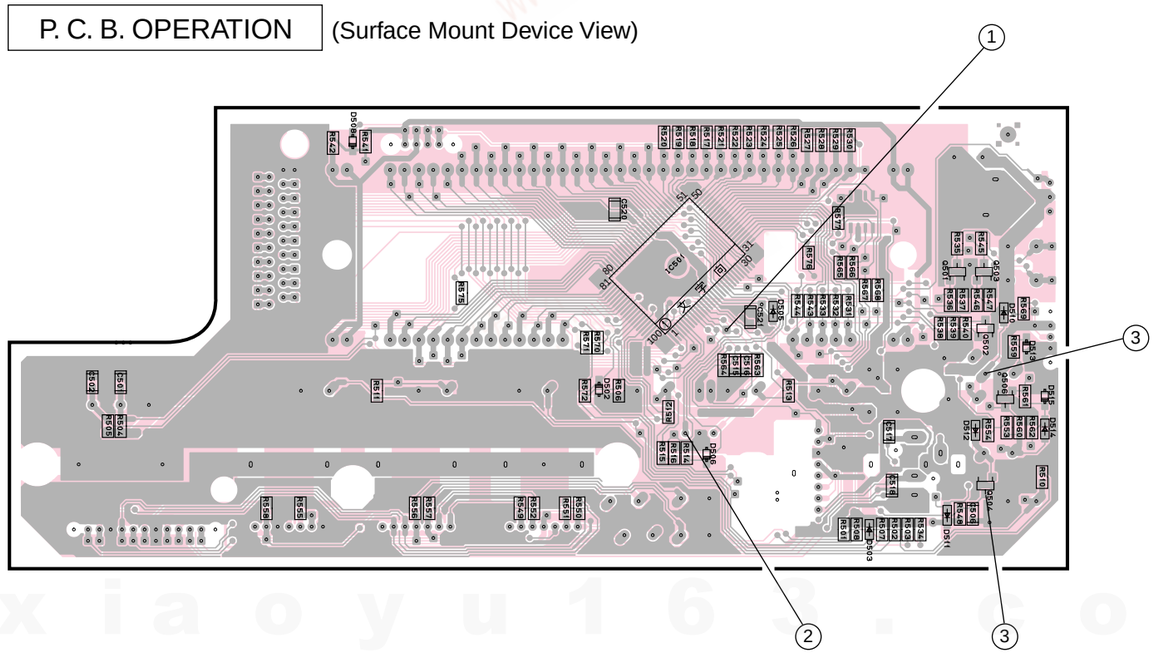
■ PRINTED CIRCUIT BOARD (Foil side)

P. C. B. OPERATION (Lead Type Device View)

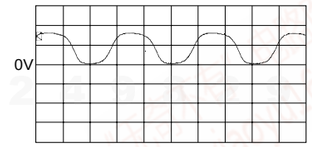


P. C. B. OPERATION (Surface Mount Device View)



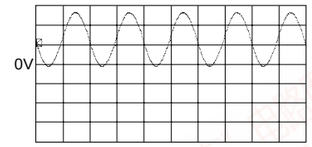
Point ① (Pin 11 of IC501)

V : 2V/div, H : 10µsec/div
DC, 1 : 1 probe



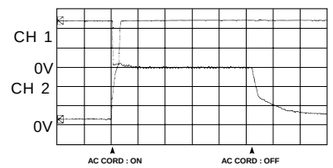
Point ② (Pin 13 of IC501)

V : 2V/div, H : 50nsec/div
DC, 1 : 1 probe



Point ③

CH 1 : Collector of Q504
CH 2 : Collector of Q505
V : 2V/div (CH 1)
V : 5V/div (CH 2)
DC, 1 : 1 probe, H : 0.5sec/div



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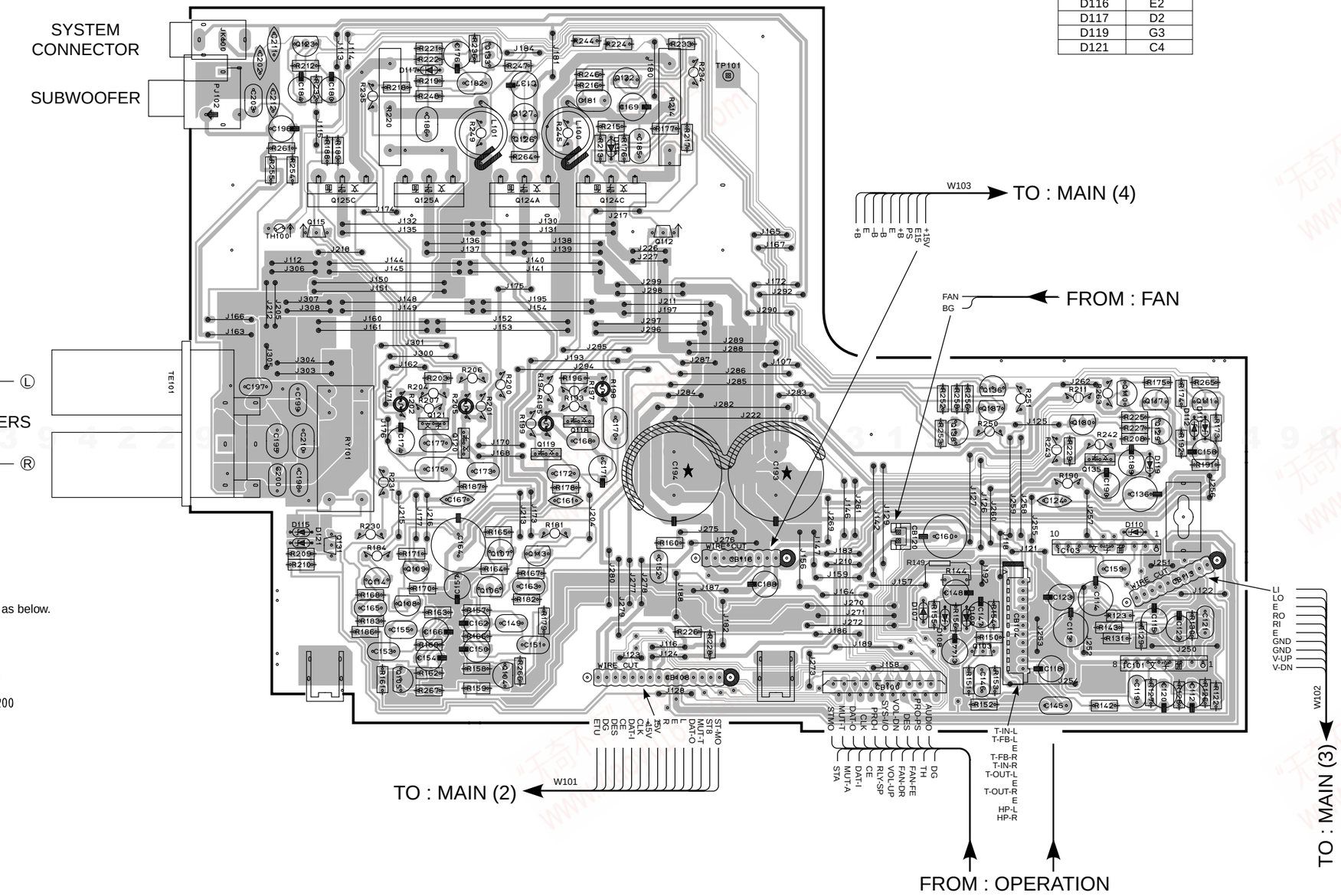
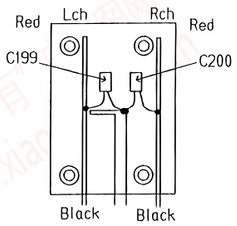
■ PRINTED CIRCUIT BOARD (Foil side)

P. C. B. MAIN (1)



Note : Mounting of C199, 200 shown as below.
(B, G models only)



CIRCUIT CHANGES BY MARKET.

	J	U, C	R	A	B, G
C199, 200	X	X	X	X	O
C197, 198	X	X	X	O	O
C195, 210	X	X	X	O	O
R144	X	O	O	O	O

O : USED
X : NOT USED

● **Semiconductor Location**

Ref. No.	Location
D107	F4
D108	F4
D109	F4
D110	G4
D111	G3
D112	G3
D115	C4
D116	E2
D117	D2
D119	G3
D121	C4

Ref. No.	Location
IC101	G4
IC103	F4

Ref. No.	Location
Q103	F4
Q104	D4
Q105	D4
Q106	D4
Q107	D4
Q108	D4
Q109	D4
Q110	G3
Q111	G3
Q112	E2
Q113	D4
Q114	D4
Q115	C2
Q117	G3
Q118	D3
Q119	D3
Q120	D3
Q121	D3
Q123	C2
Q124A	D2
Q124C	E2
Q125A	D2
Q125C	C2
Q126	D2
Q127	D2
Q129	G3
Q130	F3
Q131	C4
Q132	E2
Q133	D2
Q135	G3
Q136	F3
Q137	F3
Q138	F3

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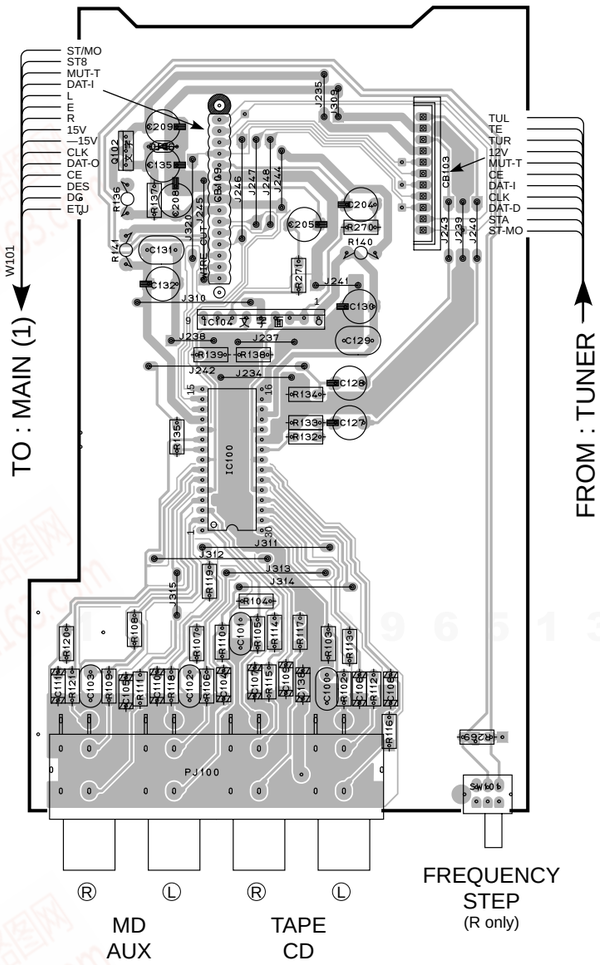
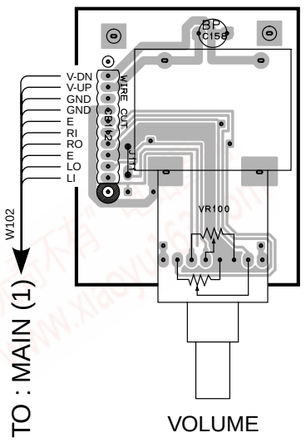
■ PRINTED CIRCUIT BOARD (Foil side)

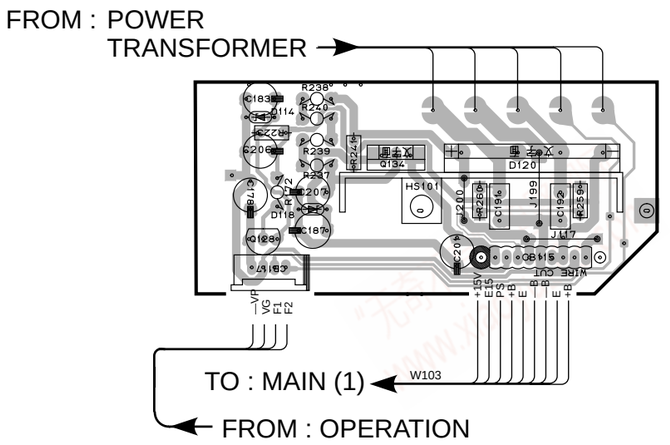
P. C. B. MAIN (2)



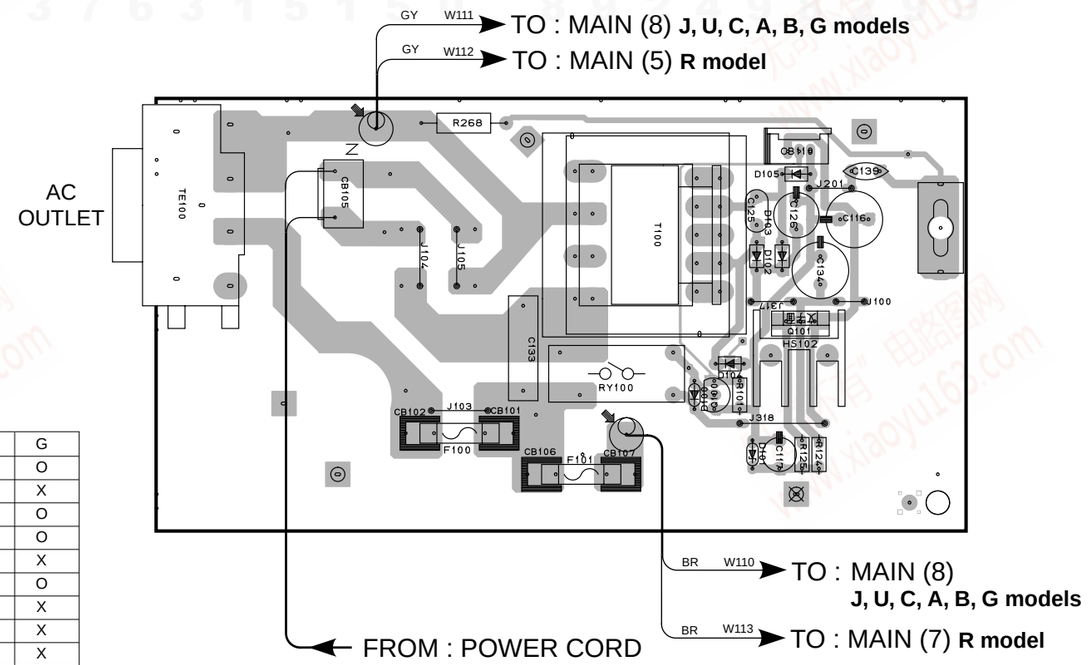
P. C. B. MAIN (3)



P. C. B. MAIN (4)



P. C. B. MAIN (6)



CIRCUIT CHANGES BY MARKET.

	J	U, C	R	A	B	G
F100	X	X	X	X	X	O
J103	O	O	O	O	O	X
CB101, 102	X	X	X	X	X	O
J100	O	O	X	O	O	O
R268	X	O	X	X	X	X
C126	O	O	X	O	O	O
C134	X	X	O	X	X	X
Q101	X	X	O	X	X	X
R124, 125	X	X	O	X	X	X
D101	X	X	O	X	X	X
C117	X	X	O	X	X	X
SW101	X	X	O	X	X	X

O : USED
X : NOT USED

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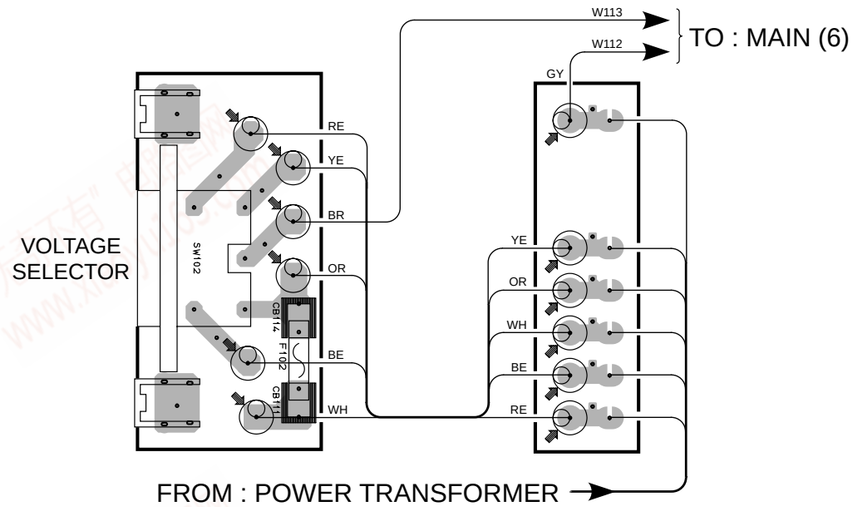
■ PRINTED CIRCUIT BOARD (Foil side)

● R model

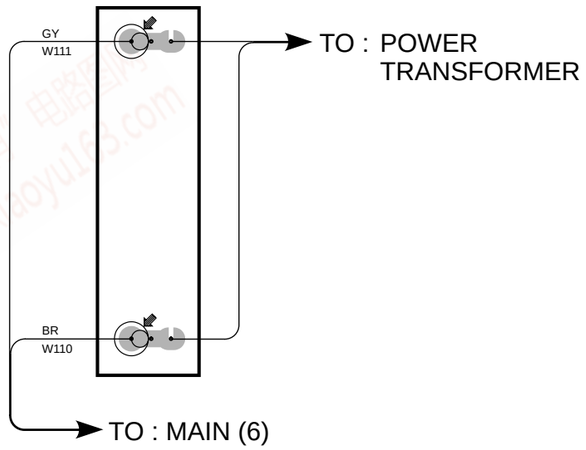
P. C. B. MAIN (7)

P. C. B. MAIN (5)



● J, U, C, A, B, G models

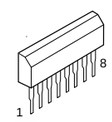
P. C. B. MAIN (8)



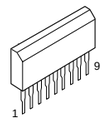
■ PIN CONNECTION DIAGRAM

● ICs

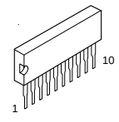
NJM2068L-D



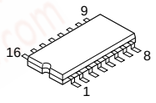
µPC4570HA



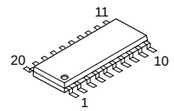
LB1641



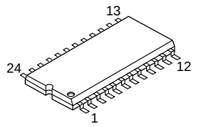
TA2040AF



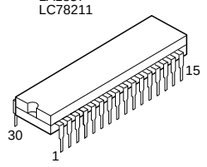
LC72131M



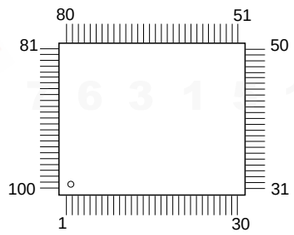
LC72720NM



LA1837
LC78211

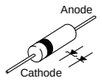


M30217M8-A100FP

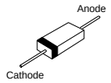


● Diodes

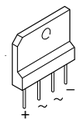
1SS133
1SS270A
1SR139-400
HZS5A2TD
HZS5C2TD
HZS12A2TD
HZS152TD
HZS302TD



1SS355
MA8056-M
MA8091-M
MA8100-M
UDZS5.1B
UDZS6.2B
UDZS6.8B

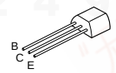


D5SB20



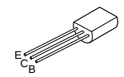
● Transistors

2SA1740S (R, S)
2SC3330 (S, T)
DTA114ES



2SA1708 (S, T)
2SC4488 (S, T)
2SC4481 (T, U)

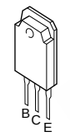
2SA893A (D, E)
2SA970 (GR, BL)
2SA1015 (Y)



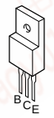
2SB647 (C, D)
2SC535 (A, B, C)
2SC1815 (Y)
2SC1890A (D, E)
2SC2229 (O, Y)
2SC2240 (GR, BL)
2SC2878 (A, B)

2SA1037AK (Q, R, S)
2SC2412K (Q, R, S)
DTC144EKA

2SA1694 (O, P, Y)
2SC4467 (O, P, Y)



2SD2396 (J, K)
2SC4495



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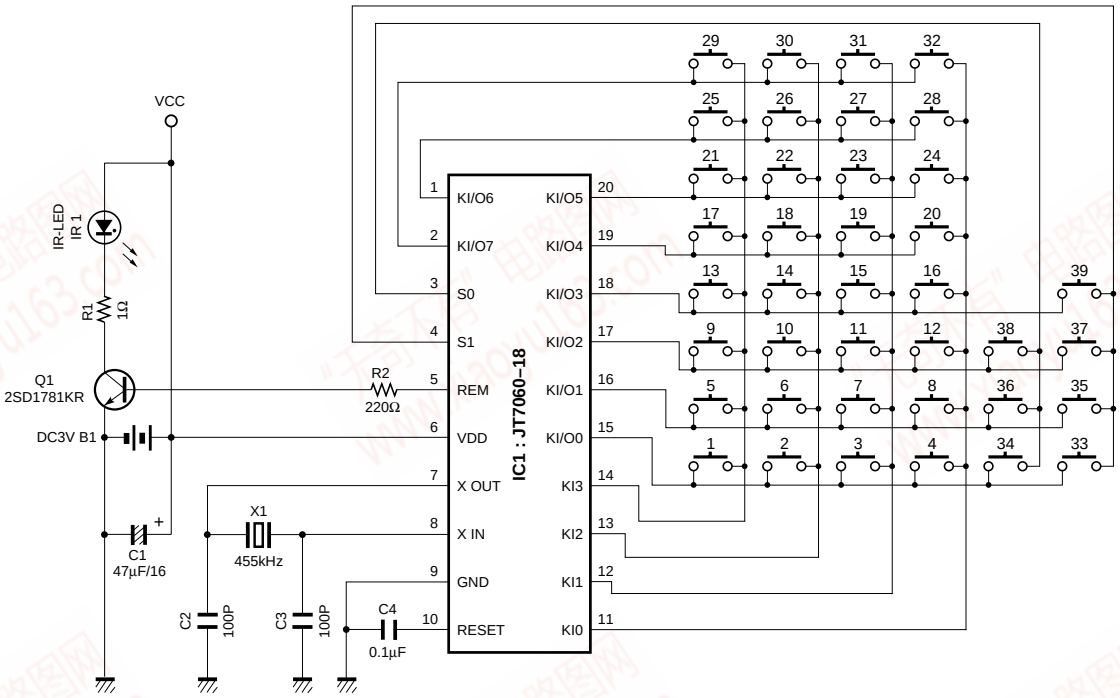
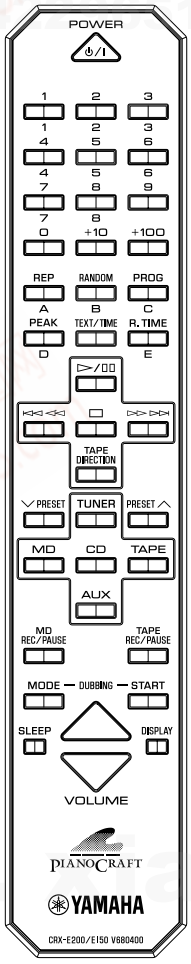
REMOTE CONTROL TRANSMITTER

■ SCHEMATIC DIAGRAM





TRANSMISSION FORMAT: NEC-FORMAT
CUSTOM CODE (HEX): 78

Key No.	Key Name	Data Code (HEX)	Key No.	Key Name	Data Code (HEX)
1	POWER	0F	21	⏮ ◀◀	04
2	1	11	22	■	01
3	2	12	23	▶▶ ⏭	03
4	3	13	24	TAPE DIRECTION	43
5	4	14	25	﹀ PRESET	1C
6	5	15	26	TUNER	4B
7	6	16	27	PRESET ﹀	1B
8	7	17	28	MD	57
9	8	18	29	CD	4A
10	9	19	30	TAPE	41
11	0 (FREQ/RDS)	10	31	AUX	49
12	+10 (MODE)	1A	32	MD REC/PAUSE	58
13	+100 (START)	1D	33	TAPE REC/PAUSE	46
14	REP (A)	0C	34	MODE	05
15	RANDOM (B)	07	35	START	06
16	PROG (C)	0B	36	SLEEP	4F
17	D	09	37	VOLUME ﹀	1E
18	TEXT/TIME	0A	38	DISPLAY	4E
19	R. TIME (E)	08	39	VOLUME ﹀	1F
20	▶ / ▮▮	02			

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PARTS LIST

■ ELECTRICAL PARTS

■ WARNING

Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.

- Carbon resistors (1/6W or 1/4W) are not included in the ELECTRICAL PARTS List. For the part Nos. of the carbon resistors, refer to the last page.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS :

C.A.EL.CHP	:	CHIP ALUMI. ELECTROLYTIC CAP
C.CE	:	CERAMIC CAP
C.CE.ARRAY	:	CERAMIC CAP ARRAY
C.CE.CHP	:	CHIP CERAMIC CAP
C.CE.ML	:	MULTILAYER CERAMIC CAP
C.CE.M.CHP	:	CHIP MULTILAYER CERAMIC CAP
C.CE.SAFTY	:	RECOGNIZED CERAMIC CAP
C.CE.TUBLR	:	CERAMIC TUBULAR CAP
C.CE.SMI	:	SEMI CONDUCTIVE CERAMIC CAP
C.EL	:	ELECTROLYTIC CAP
C.MICA	:	MICA CAP
C.ML.FLM	:	MULTILAYER FILM CAP
C.MP	:	METALLIZED PAPER CAP
C.MYLAR	:	MYLAR FILM CAP
C.MYLAR.ML	:	MULTILAYER MYLAR FILM CAP
C.PAPER	:	PAPER CAPACITOR
C.PLS	:	POLYSTYRENE FILM CAP
C.POL	:	POLYESTER FILM CAP
C.POLY	:	POLYETHYLENE FILM CAP
C.PP	:	POLYPROPYLENE FILM CAP
C.TNTL	:	TANTALUM CAP
C.TNTL.CHP	:	CHIP TANTALUM CAP
C.TRIM	:	TRIMMER CAP
CN	:	CONNECTOR
CN.BS.PIN	:	CONNECTOR, BASE PIN
CN.CANNON	:	CONNECTOR, CANNON
CN.DIN	:	CONNECTOR, DIN
CN.FLAT	:	CONNECTOR, FLAT CABLE
CN.POST	:	CONNECTOR, BASE POST
COIL.MX.AM	:	COIL, AM MIX
COIL.AT.FM	:	COIL, FM ANTENNA
COIL.DT.FM	:	COIL, FM DETECT
COIL.MX.FM	:	COIL, FM MIX
COIL.OUTPT	:	OUTPUT COIL
DIOD.ARRAY	:	DIODE ARRAY
DIODE.BRG	:	DIODE BRIDGE
DIODE.CHP	:	CHIP DIODE
DIODE.VAR	:	VARACTOR DIODE
DIOD.Z.CHP	:	CHIP ZENER DIODE
DIODE.ZENR	:	ZENER DIODE
DSCR.CE	:	CERAMIC DISCRIMINATOR
FER.BEAD	:	FERRITE BEADS
FER.CORE	:	FERRITE CORE
FET.CHP	:	CHIP FET
FL.DSPLY	:	FLUORESCENT DISPLAY
FLTR.CE	:	CERAMIC FILTER
FLTR.COMB	:	COMB FILTER MODULE
FLTR.LC.RF	:	LC FILTER ,EMI
GND.MTL	:	GROUND PLATE
GND.TERM	:	GROUND TERMINAL
HOLDER.FUS	:	FUSE HOLDER
IC.PRTCT	:	IC PROTECTOR
JUMPER.CN	:	JUMPER CONNECTOR
JUMPER.TST	:	JUMPER, TEST POINT
L.DTCT	:	LIGHT DETECTING MODULE
L.EMIT	:	LIGHT EMITTING MODULE
LED.DSPLY	:	LED DISPLAY
LED.INFRD	:	LED, INFRARED
MODUL.RF	:	MODULATOR, RF
PHOT.CPL	:	PHOTO COUPLER
PHOT.INTR	:	PHOTO INTERRUPTER
PHOT.RFLCT	:	PHOTO REFLECTOR
PIN.TEST	:	PIN, TEST POINT
PLST.RIVET	:	PLASTIC RIVET
R.ARRAY	:	RESISTOR ARRAY
R.CAR	:	CARBON RESISTOR
R.CAR.CHP	:	CHIP RESISTOR
R.CAR.FP	:	FLAME PROOF CARBON RESISTOR
R.FUS	:	FUSABLE RESISTOR
R.MTL.CHP	:	CHIP METAL FILM RESISTOR
R.MTL.FLM	:	METAL FILM RESISTOR
R.MTL.OXD	:	METAL OXIDE FILM RESISTOR
R.MTL.PLAT	:	METAL PLATE RESISTOR
RSNR.CE	:	CERAMIC RESONATOR
RSNR.CRYS	:	CRYSTAL RESONATOR
R.TW.CEM	:	TWIN CEMENT FIXED RESISTOR
R.WW	:	WIRE WOUND RESISTOR
SCR.BND.HD	:	BIND HEAD B-TITE SCREW
SCR.BW.HD	:	BW HEAD TAPPING SCREW
SCR.CUP	:	CUP TITE SCREW
SCR.TERM	:	SCREW TERMINAL
SCR.TR	:	SCREW, TRANSISTOR
SUPRT.PCB	:	SUPPORT, P.C.B.
SURG.PRTCT	:	SURGE PROTECTOR
SW.TACT	:	TACT SWITCH
SW.LEAF	:	LEAF SWITCH
SW.LEVER	:	LEVER SWITCH
SW.MICRO	:	MICRO SWITCH
SW.PUSH	:	PUSH SWITCH
SW.RT.ENC	:	ROTARY ENCODER
SW.RT.MTR	:	ROTARY SWITCH WITH MOTOR
SW.RT	:	ROTARY SWITCH
SW.SLIDE	:	SLIDE SWITCH
TERM.SP	:	SPEAKER TERMINAL
TERM.WRAP	:	WRAPPING TERMINAL
THRMST.CHP	:	CHIP THERMISTOR
TR.CHP	:	CHIP TRANSISTOR
TR.DGT	:	DIGITAL TRANSISTOR
TR.DGT.CHP	:	CHIP DIGITAL TRANSISTOR
TRANS	:	TRANSFORMER
TRANS.PULS	:	PULSE TRANSFORMER
TRANS.PWR	:	POWER TRANSFORMER ASS'y
TUNER.AM	:	TUNER PACK, AM
TUNER.FM	:	TUNER PACK, FM
TUNER.PK	:	FRONT-END TUNER PACK
VR	:	ROTARY POTENTIOMETER
VR.MTR	:	POTENTIOMETER WITH MOTOR
VR.SW	:	POTENTIOMETER WITH ROTARY SW
VR.SLIDE	:	SLIDE POTENTIOMETER
VR.TRIM	:	TRIMMER POTENTIOMETER

Note) Those parts marked with "#" are not included in the P.C.B. ass'y.

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P.C.B. MAIN

Schm Ref.	PART NO.	Description		Market
	V4217700	P.C.B.	MAIN	UC
	V4217800	P.C.B.	MAIN	R
	V4217900	P.C.B.	MAIN	A
	V4218000	P.C.B.	MAIN	B
	V4218100	P.C.B.	MAIN	G
CB100	VQ047500	CN.BS.PIN	20P	
CB101	VP206500	HOLDER.FUS	EYF-52BCT	G
CB102	VP206500	HOLDER.FUS	EYF-52BCT	G
CB103	VQ963200	CN.BS.PIN	11P	
CB104	VK025500	CN.BS.PIN	11P	
CB105	VG879900	CN.BS.PIN	2P	
CB106	VP206500	HOLDER.FUS	EYF-52BCT	
CB107	VP206500	HOLDER.FUS	EYF-52BCT	
CB108	Vi879300	CN.BS.PIN	15P	
CB109	Vi879300	CN.BS.PIN	15P	
CB110	VK026200	CN.BS.PIN	3P	
CB111	VP206500	HOLDER.FUS	EYF-52BCT	R
CB112	Vi878800	CN.BS.PIN	10P	
CB113	Vi878800	CN.BS.PIN	10P	
CB114	VP206500	HOLDER.FUS	EYF-52BCT	R
CB115	Vi878700	CN.BS.PIN	9P	
CB116	Vi878700	CN.BS.PIN	9P	
CB117	VK026300	CN.BS.PIN	4P	
CB120	VB389800	CN.BS.PIN	2P	
C100	UA652100	C.MYLAR	100pF 50V	
C101	UA652100	C.MYLAR	100pF 50V	
C102	UA652100	C.MYLAR	100pF 50V	
C103	UA652100	C.MYLAR	100pF 50V	
C104	VF466700	C.CE.TUBLR	47pF 50V	
C105	VF466700	C.CE.TUBLR	47pF 50V	
C106	VF466800	C.CE.TUBLR	100pF 50V	
C107	VF466800	C.CE.TUBLR	100pF 50V	
C108	VF466700	C.CE.TUBLR	47pF 50V	
C109	VF466700	C.CE.TUBLR	47pF 50V	
C110	VF466800	C.CE.TUBLR	100pF 50V	
C111	VF466800	C.CE.TUBLR	100pF 50V	
C112	UR866220	C.EL	2.2uF 50V	
C113	UR838330	C.EL	330uF 16V	
C114	UR838330	C.EL	330uF 16V	
C115	UR866220	C.EL	2.2uF 50V	
C116	UR838100	C.EL	100uF 16V	R
C116	UR848330	C.EL	330uF 25V	UCABG
C117	UR837100	C.EL	10uF 16V	R
C118	UR837470	C.EL	47uF 16V	
C119	VR325000	C.MYLAR	100pF 100V	
C120	UR866220	C.EL	2.2uF 50V	
C121	VR325000	C.MYLAR	100pF 100V	
C122	UR866220	C.EL	2.2uF 50V	
C123	UR837470	C.EL	47uF 16V	
C124	FG644100	C.CE	0.01uF 50V	
C125	UA654100	C.MYLAR	0.01uF 50V	
C126	UR848330	C.EL	330uF 25V	UCABG
C127	UR837100	C.EL	10uF 16V	

＊New Parts

Schm Ref.	PART NO.	Description		Market
C128	UR837100	C.EL	10uF 16V	
C129	VE326000	C.MYLAR.ML	0.1uF 50V	
C130	UR837470	C.EL	47uF 16V	
C131	VE326000	C.MYLAR.ML	0.1uF 50V	
C132	UR837470	C.EL	47uF 16V	
⚠ C133	VS741700	C.CE.SAFTY	0.01uF 275V	
C134	UR878330	C.EL	330uF 63V	R
C135	UR837100	C.EL	10uF 16V	
C136	UR838470	C.EL	470uF 16V	
C137	UR818100	C.EL	100uF 6.3V	
C138	VF467300	C.CE.TUBLR	0.01uF 16V	
C139	FG644100	C.CE	0.01uF 50V	
C144	UR847100	C.EL	10uF 25V	
C145	VE326000	C.MYLAR.ML	0.1uF 50V	
C146	VE326000	C.MYLAR.ML	0.1uF 50V	
C147	UR838100	C.EL	100uF 16V	
C148	UR866220	C.EL	2.2uF 50V	
C149	UA652220	C.MYLAR	220pF 50V	
C150	UR866470	C.EL	4.7uF 50V	
C151	UA652100	C.MYLAR	100pF 50V	
C152	UA652100	C.MYLAR	100pF 50V	
C153	UA652100	C.MYLAR	100pF 50V	
C154	UR866470	C.EL	4.7uF 50V	
C155	UA652220	C.MYLAR	220pF 50V	
C156	UR857100	C.EL	10uF 35V	
C157	UR838100	C.EL	100uF 16V	
C158	UN866100	C.EL	1uF 50V	
C159	UA654100	C.MYLAR	0.01uF 50V	
C160	UR768470	C.EL	470uF 50V	
C161	FG651330	C.CE	33pF 50V	
C162	UR837470	C.EL	47uF 16V	
C163	UA653100	C.MYLAR	1000pF 50V	
C164	VK347900	C.EL	470uF 63V	
C165	UA653100	C.MYLAR	1000pF 50V	
C166	UR837470	C.EL	47uF 16V	
C167	FG651330	C.CE	33pF 50V	
C168	VR325000	C.MYLAR	100pF 100V	
C169	UR867470	C.EL	47uF 50V	
C170	UA654820	C.MYLAR	0.082uF 50V	
C171	UR867470	C.EL	47uF 50V	
C172	VR325000	C.MYLAR	100pF 100V	
C173	VR325000	C.MYLAR	100pF 100V	
C174	UR867470	C.EL	47uF 50V	
C175	UA654820	C.MYLAR	0.082uF 50V	
C176	UR867470	C.EL	47uF 50V	
C177	VR325000	C.MYLAR	100pF 100V	
C178	UR866470	C.EL	4.7uF 50V	
C180	UR865220	C.EL	0.22uF 50V	
C181	VE326000	C.MYLAR.ML	0.1uF 50V	
C182	VE326000	C.MYLAR.ML	0.1uF 50V	
C183	UR866470	C.EL	4.7uF 50V	
C184	UR866470	C.EL	4.7uF 50V	
C185	UA654220	C.MYLAR	0.022uF 50V	

＊New Parts

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P.C.B. MAIN

	Schm Ref.	PART NO.	Description		Market
	C186	UA654220	C.MYLAR	0.022uF 50V	
	C187	UR838100	C.EL	100uF 16V	
	C188	UR866470	C.EL	4.7uF 50V	
	C189	UR838100	C.EL	100uF 16V	
	C190	UR866470	C.EL	4.7uF 50V	
⚠	C191	VS745400	C.POL.MTL	0.1uF 100V	
⚠	C192	VS745400	C.POL.MTL	0.1uF 100V	
⚠	C193	V3588900	C.EL	5600uF 45V	
⚠	C194	V3588900	C.EL	5600uF 45V	
	C195	VE326000	C.MYLAR.ML	0.1uF 50V	ABG
	C196	UR866220	C.EL	2.2uF 50V	
	C197	UA654100	C.MYLAR	0.01uF 50V	ABG
	C198	UA654100	C.MYLAR	0.01uF 50V	ABG
	C199	UA653470	C.MYLAR	4700pF 50V	BG
	C200	UA653470	C.MYLAR	4700pF 50V	BG
	C201	UR847100	C.EL	10uF 25V	
	C202	FG652100	C.CE	100pF 50V	
	C203	UA652100	C.MYLAR	100pF 50V	
	C204	UR847100	C.EL	10uF 25V	
	C205	UR847100	C.EL	10uF 25V	
	C206	UR867100	C.EL	10uF 50V	
	C207	UR867100	C.EL	10uF 50V	
	C208	UR837100	C.EL	10uF 16V	
	C209	UR837100	C.EL	10uF 16V	
	C210	VE326000	C.MYLAR.ML	0.1uF 50V	ABG
	C211	FG644100	C.CE	0.01uF 50V	
	C212	FG644100	C.CE	0.01uF 50V	
	D100	VD631600	DIODE	1SS133,176	
	D101	VM975500	DIODE.ZENR	HZS12A2TD 12V	R
	D102	VU264100	DIODE	1SR139-400	
	D103	VU264100	DIODE	1SR139-400	
	D104	VU264100	DIODE	1SR139-400	
	D105	VU264100	DIODE	1SR139-400	
	D106	VM975500	DIODE.ZENR	HZS12A2TD 12V	
	D107	VD631600	DIODE	1SS133,176	
	D108	VM974200	DIODE.ZENR	HZS5C2TD 5.0V	
	D109	VD631600	DIODE	1SS133,176	
	D110	VM974200	DIODE.ZENR	HZS5C2TD 5.0V	
	D111	VM974000	DIODE.ZENR	HZS5A2TD 5.0V	
	D112	VM974000	DIODE.ZENR	HZS5A2TD 5.0V	
	D114	VM976500	DIODE.ZENR	HZS302TD 30V	
	D115	VM975500	DIODE.ZENR	HZS12A2TD 12V	
	D116	VN008700	DIODE	1SS270A	
	D117	VN008700	DIODE	1SS270A	
⚠	D118	VM975800	DIODE.ZENR	HZS152TD 15V	
	D119	VM975800	DIODE.ZENR	HZS152TD 15V	
⚠	D120	VN011400	DIODE.BRG	D5SB20 5A 200V	
	D121	VM975500	DIODE.ZENR	HZS12A2TD 12V	
⚠	F100	VT942900	FUSE	TH2.5A 250V	G
⚠	F101	KB000680	FUSE	1.25A 250V	ABG
⚠	F101	VS822900	FUSE	T4.0A 125V	UCR
⚠	F102	KB000680	FUSE	1.25A 250V	R
	HS101	V2989200	HEAT.SINK		

＊New Parts

	Schm Ref.	PART NO.	Description		Market
	HS102	VR506800	HEAT.SINK	PUH16-25	R
	IC100	XP894A00	IC	LC78211	
	IC101	XM356A00	IC	NJM2068LD	
	IC103	XF494A00	IC	LB1641	
	IC104	XB247A00	IC	uPC4570HA	
	JK100	VJ726800	JACK.MNI		
	L100	V2604200	COIL	1uH	
	L101	V2604200	COIL	1uH	
	PJ100	V4164500	JACK.PIN	12P	
	PJ102	VV306800	JACK.PIN	1P	
	Q100	iC224030	TR	2SC2240 GR,BL	
	Q101	VR510800	TR	2SD2396 J,K	R
⚠	Q102	VP872700	TR	2SC4488 S,T	
	Q103	iC174020	TR	2SC1740S R,S	
	Q104	iC287820	TR	2SC2878 A,B	
	Q105	iC287820	TR	2SC2878 A,B	
⚠	Q106	VP883000	TR	2SA893A D,E	
⚠	Q107	VP883000	TR	2SA893A D,E	
⚠	Q108	VP883000	TR	2SA893A D,E	
⚠	Q109	VP883000	TR	2SA893A D,E	
	Q110	VR402300	TR	2SB647 C,D	
	Q111	iA097030	TR	2SA970 GR,BL	
⚠	Q112	VC218900	TR	2SC3330 R,S,T	
⚠	Q113	VR325600	TR	2SC2229 O,Y	
⚠	Q114	VR325600	TR	2SC2229 O,Y	
⚠	Q115	VC218900	TR	2SC3330 R,S,T	
	Q117	iC224030	TR	2SC2240 GR,BL	
⚠	Q118	VP872700	TR	2SC4488 S,T	
⚠	Q119	VP872600	TR	2SA1708 S,T	
⚠	Q120	VP872600	TR	2SA1708 S,T	
⚠	Q121	VP872700	TR	2SC4488 S,T	
	Q123	iA097030	TR	2SA970 GR,BL	
⚠	Q124A	iX615750	TR	2SA1694 O,P,Y	
⚠	Q124C	iX615760	TR	2SC4467 O,P,Y	
⚠	Q125A	iX615750	TR	2SA1694 O,P,Y	
⚠	Q125C	iX615760	TR	2SC4467 O,P,Y	
	Q126	iC224030	TR	2SC2240 GR,BL	
	Q127	iC224030	TR	2SC2240 GR,BL	
	Q128	iA1015IO	TR	2SA1015 Y	
	Q129	iC224030	TR	2SC2240 GR,BL	
	Q130	iA097030	TR	2SA970 GR,BL	
⚠	Q131	VC218900	TR	2SC3330 R,S,T	
⚠	Q132	VP883100	TR	2SC1890A D,E	
⚠	Q133	VP883100	TR	2SC1890A D,E	
⚠	Q134	VN996900	TR	2SC4495	
⚠	Q135	VP872600	TR	2SA1708 S,T	
	Q136	iC287820	TR	2SC2878 A,B	
	Q137	iC287820	TR	2SC2878 A,B	
	Q138	iA097030	TR	2SA970 GR,BL	
⚠	R136	HV753470	R.CAR.FP	4.7Ω 1/4W	
⚠	R140	HV753220	R.CAR.FP	2.2Ω 1/4W	
⚠	R141	HV753220	R.CAR.FP	2.2Ω 1/4W	
⚠	R172	HV753470	R.CAR.FP	4.7Ω 1/4W	

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Schm Ref.	PART NO.	Description			Market
⚠	R181	HV754470	R.CAR.FP	47Ω 1/4W	
⚠	R184	HV754470	R.CAR.FP	47Ω 1/4W	
⚠	R190	VV901100	R.MTL.OXD	120Ω 1W	
⚠	R193	HV756270	R.CAR.FP	2.7KΩ 1/4W	
⚠	R194	HV753470	R.CAR.FP	4.7Ω 1/4W	
⚠	R195	VK188400	R.FUS	330Ω 1/4W	
⚠	R197	HV756100	R.CAR.FP	1KΩ 1/4W	
⚠	R198	VK189000	R.FUS	1KΩ 1/4W	
⚠	R199	HV753470	R.CAR.FP	4.7Ω 1/4W	
⚠	R200	VP940200	R.MTL.OXD	47Ω 1W	
⚠	R201	HV753470	R.CAR.FP	4.7Ω 1/4W	
⚠	R202	VK189000	R.FUS	1KΩ 1/4W	
⚠	R204	HV756100	R.CAR.FP	1KΩ 1/4W	
⚠	R205	VK188400	R.FUS	330Ω 1/4W	
⚠	R206	HV753470	R.CAR.FP	4.7Ω 1/4W	
⚠	R207	HV756270	R.CAR.FP	2.7KΩ 1/4W	
⚠	R211	HV753100	R.CAR.FP	1Ω 1/4W	
⚠	R214	VU981700	R.MTL.PLAT	0.22Ω+0.22 3W	
⚠	R220	VU981700	R.MTL.PLAT	0.22Ω+0.22 3W	
⚠	R230	VP940700	R.MTL.OXD	330Ω 1W	
⚠	R231	VP940700	R.MTL.OXD	330Ω 1W	
⚠	R234	VP939800	R.MTL.OXD	10Ω 1W	
⚠	R235	VP939800	R.MTL.OXD	10Ω 1W	
⚠	R237	VP939900	R.MTL.OXD	15Ω 1W	
⚠	R238	VP939900	R.MTL.OXD	15Ω 1W	
⚠	R239	VP939900	R.MTL.OXD	15Ω 1W	
⚠	R240	VP939900	R.MTL.OXD	15Ω 1W	
⚠	R242	HV756470	R.CAR.FP	4.7KΩ 1/4W	
⚠	R243	HV755680	R.CAR.FP	680Ω 1/4W	
	R245	HV754100	R.CAR.FP	10Ω 1/4W	
	R249	HV754100	R.CAR.FP	10Ω 1/4W	
	R250	VP940700	R.MTL.OXD	330Ω 1W	
	R251	VP940700	R.MTL.OXD	330Ω 1W	
⚠	R263	VP939800	R.MTL.OXD	10Ω 1W	
	RY100	V2712300	RELAY	DC SDT-S-112LMR	
⚠	RY101	VK438300	RELAY	DH24D2-OT/M2	
	SW101	V3624300	SW.SLIDE	SS029-P022MJB-PA6	R
⚠	SW102	VG388100	VOLT.SELCT	HXW0244-01-080	R
⚠	T100	XC082A00	TRANS.PWR		R
⚠	T100	XC084A00	TRANS.PWR		ABG
⚠	T100	XV443A00	TRANS.PWR		UC
⚠	TE100	VT915000	OUTLET.AC	2P	A
⚠	TE100	VU543300	OUTLET.AC	1P	B
⚠	TE100	VV537400	OUTLET.AC	1P	G
⚠	TE100	VV537800	OUTLET.AC	1P	UCR
	TE101	V2504700	TERM.SP	4P	ABG
	TE101	VF018400	TERM.SP	4P	UCR
	TH100	V4185500	THRMST	NTH4G33B103F01 10K	
	TP101	VT969000	PIN.TEST	IRS-2049	
	VR100	V3555900	VR.MTR	EUW MGM 021 A15	
		V3750200	PIN	L=70	
		V3750100	PIN	L=50	
		VY940400	CUSHION	T=0.8	

＊New Parts

Schm Ref.	PART NO.	Description			Market
	V4040500	SCR.TERM	M3		
	VR264300	PLATE.GND			
	VQ368600	PUSH.RIVET	P3555-B		
	EP600830	SCR.BND.HD	3x8	MFC2-BL	
	EP600140	SCR.BND.HD	3x10	MFZN2-BL	R
	V4193900	P.C.B.	SI:OPERATION		
CB501	VQ045000	CN.BS.PIN	20P		
CB503	Vi878200	CN.BS.PIN	4P		
CB504	Vi878900	CN.BS.PIN	11P		
CB505	Vi878100	CN.BS.PIN	3P		
C501	UB012680	C.CE.M.CHP	680pF	50V	
C502	UB012680	C.CE.M.CHP	680pF	50V	
C503	UM388100	C.EL	100uF	10V	
C504	UM388100	C.EL	100uF	10V	
C505	VU545000	C.EL	47000uF	5.5V	
C506	UB045100	C.CE.M.CHP	0.1uF	50V	
C507	UA655120	C.MYLAR	0.12uF	50V	
C508	UA654330	C.MYLAR	0.033uF	50V	
C509	UA654330	C.MYLAR	0.033uF	50V	
C510	UA655120	C.MYLAR	0.12uF	50V	
C511	UM416100	C.EL	1uF	50V	
C512	UM388100	C.EL	100uF	10V	
C513	UM416220	C.EL	2.2uF	50V	
C514	UM397100	C.EL	10uF	16V	
C515	VJ900300	C.CE.M.CHP	22pF	50V	
C516	VJ900300	C.CE.M.CHP	22pF	50V	
C517	UB044100	C.CE.M.CHP	0.01uF	50V	
C518	UB044100	C.CE.M.CHP	0.01uF	50V	
C520	UB045100	C.CE.M.CHP	0.1uF	50V	
C521	UB045100	C.CE.M.CHP	0.1uF	50V	
C522	UB044100	C.CE.M.CHP	0.01uF	50V	
C523	UB044100	C.CE.M.CHP	0.01uF	50V	
C524	UB013100	C.CE.M.CHP	1000pF	50V	
D502	VU171900	DIODE.ZENR	UDZ5.1B	5.1V	
D503	VT332900	DIODE	1SS355		
D505	VT332900	DIODE	1SS355		
D506	VU171900	DIODE.ZENR	UDZ5.1B	5.1V	
D507	VR711400	LED(gr)	SLR-325MC		
D508	VU171900	DIODE.ZENR	UDZ5.1B	5.1V	
D509	VS132300	LED(re)	SLR-325VCT31		
D510	VT332900	DIODE	1SS355		
D511	VT332900	DIODE	1SS355		
D512	VT332900	DIODE	1SS355		
D513	VU172100	DIODE.ZENR	UDZS6.2B	6.2V	
D514	VT332900	DIODE	1SS355		
D515	VU172200	DIODE.ZENR	UDZ6.8B	6.8V	
IC501	XV939B00	IC.CPU	M30217M8-A101FP		
JK501	V3589000	JACK.MNI	HTJ-035-18EBGT		
Q501	VV556400	TR	2SC2412K Q,R,S		
Q502	VV556500	TR	2SA1037K Q,R,S		

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Schm Ref.	PART NO.	Description		Market
Q503	VV556400	TR	2SC2412K Q,R,S	
Q504	VV655700	TR.DGT	DTC144EKA	
Q505	VR412800	TR	2SC4481 T,U	
Q506	VV556500	TR	2SA1037K Q,R,S	
R549	RD556180	R.THCK.CHP	1.8KΩ 1/10W	
R550	RD556180	R.THCK.CHP	1.8KΩ 1/10W	
R551	RD556180	R.THCK.CHP	1.8KΩ 1/10W	
R552	RD556180	R.THCK.CHP	1.8KΩ 1/10W	
R556	RD555390	R.THCK.CHP	390Ω 1/10W	
R557	RD555390	R.THCK.CHP	390Ω 1/10W	
SW501	V2014900	SW.TACT	EVQ21304M	
SW502	V2014900	SW.TACT	EVQ21304M	
SW503	V2014900	SW.TACT	EVQ21304M	
SW504	V2014900	SW.TACT	EVQ21304M	
SW505	V2014900	SW.TACT	EVQ21304M	
SW506	V2014900	SW.TACT	EVQ21304M	
SW507	VT140300	SW.RT.ENC	EC16B12204	
SW508	V2014900	SW.TACT	EVQ21304M	
U501	VU591000	L.DTCT	GP1U271X	
V501	V3579300	FL.DSPLY	16-BT-67GN	
VR501	V3555700	VR	W25KΩ	
VR502	V3555600	VR	B20KΩ	
VR503	V3555800	VR	MN100KΩ	
XL501	VQ328900	RSNR.CRYS	32.768KHz	
XL502	VQ791000	RSNR.CE	10MHz	
	V3688300	SHEET.FL	SI	
!	VR519500	SHEET.FL	GD	
	V3747500	SUPRT		
	V3747400	SPACER.FL	T4x6x18	

＊New Parts

! : Note on the Operation PCB

Of the Operation PCB part Nos., only the silver (SI) type part Nos. are included in the table.

The only different part between the gold (GD) and silver (SI) type parts is the sheet/FL that is attached to the fluorescent character display tube. When a GD type Operation PCB becomes necessary, order a SI type Operation PCB and a GD type sheet/FL (VR519500) and replace the sheet/FL of the SI type Operation PCB with the GD type sheet/FL.

Schm Ref.	PART NO.	Description			Market
	V5000200	P.C.B.	TU-03		UCR
	V5000300	P.C.B.	TU-03		A
	V5000400	P.C.B.	TU-03		BG
CB1	VQ961400	CN.BS.PIN	11P		
C1	UB044100	C.CE.M.CHP	0.01uF	50V	
C2	UR838100	C.EL	100uF	16V	
C3	UB044100	C.CE.M.CHP	0.01uF	50V	
C4	UR865220	C.EL	0.22uF	50V	
C5	UB044100	C.CE.M.CHP	0.01uF	50V	
C6	UB044100	C.CE.M.CHP	0.01uF	50V	
C7	UB044100	C.CE.M.CHP	0.01uF	50V	
C8	UB044100	C.CE.M.CHP	0.01uF	50V	
C9	UB044470	C.CE.M.CHP	0.047uF	50V	
C10	VA760500	C.CE	8pF	50V	
C11	UR837100	C.EL	10uF	16V	
C12	UB044100	C.CE.M.CHP	0.01uF	50V	
C13	UR837470	C.EL	47uF	16V	
C14	UB044470	C.CE.M.CHP	0.047uF	50V	
C15	UB044100	C.CE.M.CHP	0.01uF	50V	
C16	UB044470	C.CE.M.CHP	0.047uF	50V	
C17	UR866100	C.EL	1uF	50V	
C18	UR865470	C.EL	0.47uF	50V	
C19	UR866100	C.EL	1uF	50V	
C20	UR866100	C.EL	1uF	50V	
C21	UB045100	C.CE.M.CHP	0.1uF	50V	
C22	UB044470	C.CE.M.CHP	0.047uF	50V	
C23	UR866220	C.EL	2.2uF	50V	
C24	UR837330	C.EL	33uF	16V	
C25	UB044470	C.CE.M.CHP	0.047uF	50V	
C26	UR866330	C.EL	3.3uF	50V	
C27	UB044470	C.CE.M.CHP	0.047uF	50V	
C28	UR837220	C.EL	22uF	25V	
C29	UB014270	C.CE.M.CHP	0.027uF	50V	
C30	UB012680	C.CE.M.CHP	680pF	50V	UCRA
C30	UB052100	C.CE.M.CHP	100pF	50V	BG
C31	UR837100	C.EL	10uF	16V	
C32	UA654430	C.MYLAR	0.043uF	50V	UCR
C32	UA954270	C.MYLAR	0.027uF	50V	ABG
C33	UA654430	C.MYLAR	0.043uF	50V	UCR
C33	UA954270	C.MYLAR	0.027uF	50V	ABG
C34	UR837100	C.EL	10uF	16V	
C35	UR837100	C.EL	10uF	16V	
C36	UR866470	C.EL	4.7uF	50V	
C37	UR866470	C.EL	4.7uF	50V	
C38	UB013270	C.CE.M.CHP	2700pF	50V	
C39	UB013270	C.CE.M.CHP	2700pF	50V	
C40	UB044100	C.CE.M.CHP	0.01uF	50V	
C41	UR837100	C.EL	10uF	16V	
C57	UR817470	C.EL	47uF	6.3V	
C58	UR817470	C.EL	47uF	6.3V	
C59	UR838100	C.EL	100uF	16V	
C60	UB052100	C.CE.M.CHP	100pF	50V	
C61	UR866100	C.EL	1uF	50V	

＊New Parts

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Schm Ref.	PART NO.	Description			Market
C62	UR837100	C.EL	10uF	16V	
C63	VJ899500	C.CE.M.CHP	10pF	50V	
C64	VJ899500	C.CE.M.CHP	10pF	50V	
C65	UB052100	C.CE.M.CHP	100pF	50V	
C67	UR817470	C.EL	47uF	6.3V	BG
C68	UB012330	C.CE.M.CHP	330pF	50V	BG
C69	UR817470	C.EL	47uF	6.3V	BG
C70	UR817470	C.EL	47uF	6.3V	BG
C71	UB012560	C.CE.M.CHP	560pF	50V	BG
C72	VJ900500	C.CE.M.CHP	27pF	50V	BG
C73	VJ900500	C.CE.M.CHP	27pF	50V	BG
C74	UB045100	C.CE.M.CHP	0.1uF	50V	BG
C80	UB044100	C.CE.M.CHP	0.01uF	50V	UCR
D1	VU995000	DIODE.ZENR	MA8091-M	9.1V	
D2	VT332900	DIODE	1SS355		
D3	VT332900	DIODE	1SS355		
D4	VT332900	DIODE	1SS355		
D5	VU993000	DIODE.ZENR	MA8056-M	5.6V	
D11	VU995400	DIODE.ZENR	MA8100-M	10V	
IC1	XW755A00	IC	LA1837 AM,FM IF		
IC2	XV229A00	IC	LC72131M		
IC4	XV230A00	IC	LC72720NM		BG
L1	GG000560	FLTR.CE	SFE10.7MS3GHY-A		UCRA
L1	V4545200	FLTR.CE	SFE10.7MJA1		BG
L2	GG000560	FLTR.CE	SFE10.7MS3GHY-A		UCRA
L2	V4545200	FLTR.CE	SFE10.7MJA1		BG
L3	VU887900	COIL	10uH		
L4	VU434500	FLTR.CE	450K PCFMT-049A		
L5	VR888000	FLTR.LC	19KHz		
L6	VR888000	FLTR.LC	19KHz		
L7	VU889500	COIL	220uH		BG
L8	VU889500	COIL	220uH		BG
L9	VU889500	COIL	220uH		BG
L10	V4608500	COIL.DT	10.7MHz		
PK1	V4299000	TUNER.FM	TFFJ2U584A		UCR
PK1	VU134500	TUNER.FM	TFFJ4E515A		ABG
PK2	VU333700	COIL.RF.AM	940536051A		
Q1	iC053540	TR	2SC535 A,B,C		
Q2	VD678500	TR.DGT	DTA114ES		
Q3	iC1815I0	TR	2SC1815 Y		
R1	HV755150	R.CAR.FP	150Ω	1/4W	
R3	HV755220	R.CAR.FP	220Ω	1/4W	
R17	VV901100	R.MTL.OXD	120Ω	1W	
R40	HV755680	R.CAR.FP	680Ω	1/4W	
TE1	VU477800	TERM.ANT	AJ-2038-040		
XL2	VY734600	RSNR.CRYS	7.2MHz		
XL4	V3930900	RSNR.CRYS	4.332MHz		BG
	BB071360	SCR.TERM	8.3x13		

＊New Parts

Schm Ref.	PART NO.	Description			Market
	RD254330	R.CAR.CHP	33Ω	1/10W	
	RD254510	R.CAR.CHP	51Ω	1/10W	
	RD255100	R.CAR.CHP	100Ω	1/10W	
	RD255220	R.CAR.CHP	220Ω	1/10W	
	RD255270	R.CAR.CHP	270Ω	1/10W	
	RD255330	R.CAR.CHP	330Ω	1/10W	
	RD255390	R.CAR.CHP	390Ω	1/10W	
	RD255470	R.CAR.CHP	470Ω	1/10W	
	RD256100	R.CAR.CHP	1KΩ	1/10W	
	RD256180	R.CAR.CHP	1.8KΩ	1/10W	
	RD256200	R.CAR.CHP	2KΩ	1/10W	
	RD256220	R.CAR.CHP	2.2KΩ	1/10W	
	RD256330	R.CAR.CHP	3.3KΩ	1/10W	
	RD256390	R.CAR.CHP	3.9KΩ	1/10W	
	RD256470	R.CAR.CHP	4.7KΩ	1/10W	
	RD256510	R.CAR.CHP	5.1KΩ	1/10W	
	RD256560	R.CAR.CHP	5.6KΩ	1/10W	
	RD256620	R.CAR.CHP	6.2KΩ	1/10W	
	RD256680	R.CAR.CHP	6.8KΩ	1/10W	
	RD257100	R.CAR.CHP	10KΩ	1/10W	
	RD257120	R.CAR.CHP	12KΩ	1/10W	
	RD257180	R.CAR.CHP	18KΩ	1/10W	
	RD257220	R.CAR.CHP	22KΩ	1/10W	
	RD257240	R.CAR.CHP	24KΩ	1/10W	
	RD257270	R.CAR.CHP	27KΩ	1/10W	
	RD257470	R.CAR.CHP	47KΩ	1/10W	
	RD257680	R.CAR.CHP	68KΩ	1/10W	
	RD258100	R.CAR.CHP	100KΩ	1/10W	
	RD258120	R.CAR.CHP	120KΩ	1/10W	
	RD258220	R.CAR.CHP	220KΩ	1/10W	
	RD556390	R.CAR.CHP	3.9KΩ	1/10W	

＊New Parts

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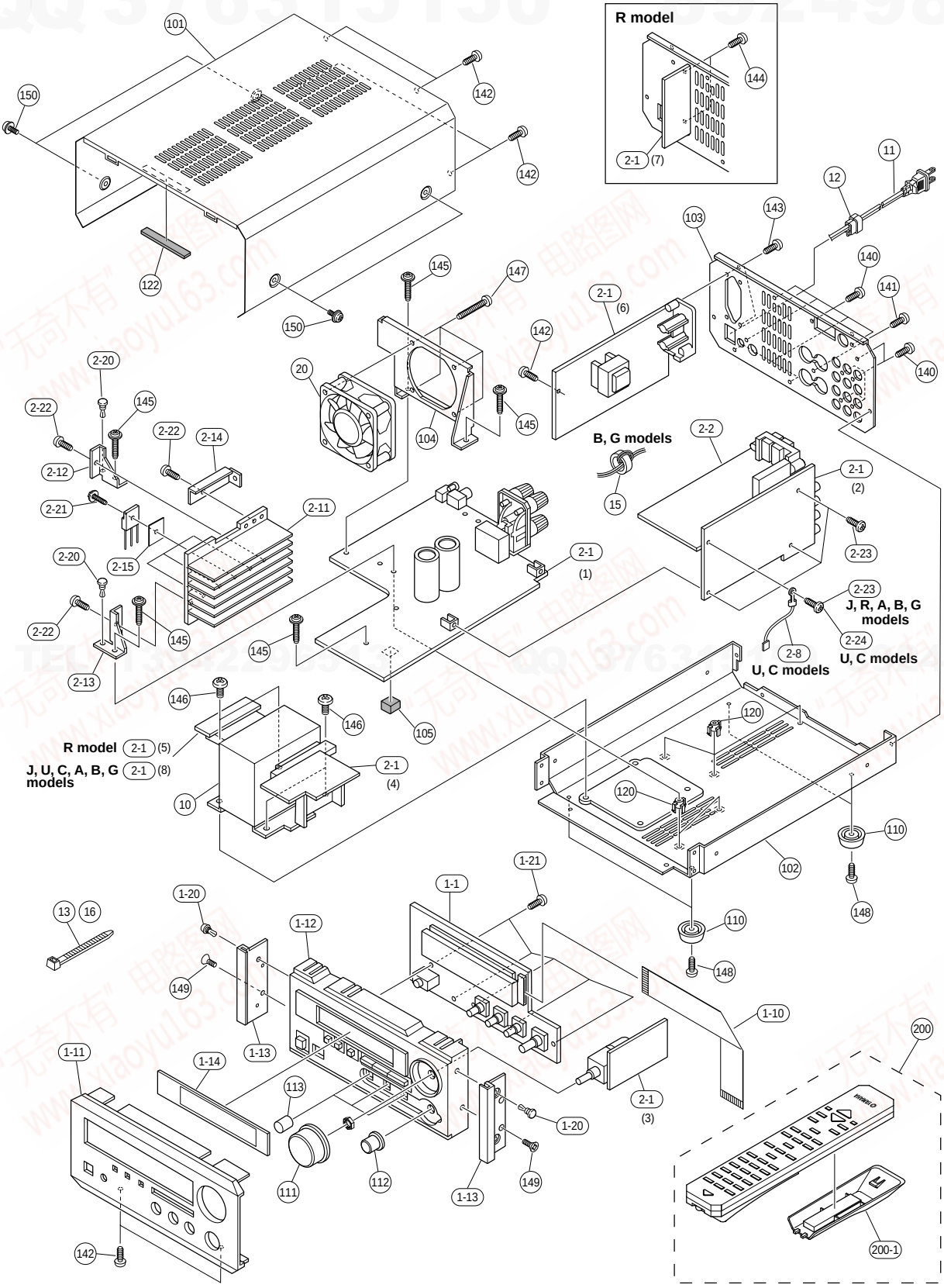
■ EXPLODED VIEW



! : Note on the Operation PCB

Of the Operation PCB(1-1) part Nos., only the silver (SI) type part Nos. are included in the table.
The only different part between the gold (GD) and silver (SI) type parts is the sheet/FL that is attached to the fluorescent character display tube. When a GD type Operation PCB becomes necessary, order a SI type Operation PCB and a GD type sheet/FL (VR519500) and replace the sheet/FL of the SI type Operation PCB with the GD type sheet/FL.

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■ MECHANICAL PARTS

	Ref. No.	PART NO.	Description		Remarks	Markets
!	1- 1	V4193900	P.C.B. ASS'Y	SI:OPERATION		
	1-10	MF120160	FLEXIBLE FLAT CABLE	20P 160mm		
*	1-11	V6779500	FRONT PANEL		SI	UCRA
*	1-11	V6779700	FRONT PANEL		SI	BG
*	1-11	V6779600	FRONT PANEL		GD	UCRA
*	1-11	V6779800	FRONT PANEL		GD	BG
	1-12	V3686800	SUB PANEL-RX		SI	
	1-12	V3810400	SUB PANEL-KX		GD	
	1-13	V3687400	PANEL, SIDE-H81			
	1-14	V3687900	SHEET, WINDOW-RX			
	1-20	VQ368600	PUSH RIVET	P3555-B		
	1-21	VF617600	PAN HEAD P-TITE SCREW	2.6x8 FCRM3-BL		
	2- 1	V4217700	P.C.B. ASS'Y	MAIN		UC
	2- 1	V4217800	P.C.B. ASS'Y	MAIN		R
	2- 1	V4217900	P.C.B. ASS'Y	MAIN		A
	2- 1	V4218000	P.C.B. ASS'Y	MAIN		B
	2- 1	V4218100	P.C.B. ASS'Y	MAIN		G
	2- 2	V5000200	P.C.B. ASS'Y	TU-03		UCR
	2- 2	V5000300	P.C.B. ASS'Y	TU-03		A
	2- 2	V5000400	P.C.B. ASS'Y	TU-03		BG
	2- 8	V4804400	EARTH CLIP ASSY	1P 50mm		UC
	2-11	V3685300	HEAT SINK			
	2-12	V3685000	SUPPORT, HS-L			
	2-13	V3685100	SUPPORT, HS-R			
	2-14	V3685200	SUPPORT, REAR			
	2-15	VV849300	SHEET	19x24		
	2-20	VQ368500	PUSH RIVET	P3545-B		
	2-21	VK173200	SCREW, TRANSISTOR	3x15 SP FCM3		
	2-22	EP600830	BIND HEAD B-TITE SCREW	3x8 FCRM3-BL		
	2-23	EG330030	BIND HEAD SCREW	3x6 FCRM3-BL		
	2-24	VT669300	PW HEAD B-TITE SCREW	3x8-8 MFC2		UC
⚠	10	XW338A00	POWER TRANSFORMER			U
⚠	10	XW339A00	POWER TRANSFORMER			C
⚠	10	XW340A00	POWER TRANSFORMER			R
⚠	10	XW341A00	POWER TRANSFORMER			A
⚠	10	XW342A00	POWER TRANSFORMER			BG
⚠	11	V2296800	POWER CORD ASS'Y			A
⚠	11	V2363800	POWER CORD ASS'Y			UC
⚠	11	VN363700	POWER CORD ASS'Y			G
⚠	11	VV437300	POWER CORD ASS'Y			B
⚠	11	VZ542500	POWER CORD ASS'Y			R
	12	V2438700	CORD STOPPER	10P1		
	13	VU590000	BINDING TIE	CBTD001B		
	15	VB933800	FERRITE CORE	BP53RB310190NOA		BG
	16	VZ625600	BINDING TIE	SE140 L=140		UCABG
	20	VV272500	DC FAN MOTOR	2410ML-05W-B20-L00		
	101	V3681600	TOP COVER		SI	
	101	V3809100	TOP COVER		GD	
	102	V3684400	CHASSIS			
	103	V3682000	REAR PANEL			U
	103	V3682100	REAR PANEL			C
	103	V3682200	REAR PANEL			R
	103	V3682300	REAR PANEL			A

* New Parts

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	Ref. No.	PART NO.	Description		Remarks	Markets
	103	V3682400	REAR PANEL			B
*	103	V6779400	REAR PANEL			G
	104	V3684900	FRAME, FAN			
	105	VZ679700	DAMPER	T8/PCB		
	110	V3688500	LEG	M0080-M0		
*	111	V6746200	KNOB	D30	SI	
*	111	V6746300	KNOB	D30	GD	
*	112	V6746700	KNOB	D12	SI	
*	112	V6746800	KNOB	D12	GD	
	113	V3687800	KNOB	D10	SI	
	113	V3811300	KNOB	D10	GD	
	120	VR264400	SPACER	H8		
	122	VP857700	DAMPER	4x6x5		
	140	VN413300	BIND HEAD BONDING B-T. SCREW	3x8 MFZN2-BL		
	141	VY731200	BONDING HEAD TAPPING SCREW	3x10 MFNI33		
	142	EP600830	BIND HEAD B-TITE SCREW	3x8 FCRM3-BL		
	143	EP600250	BIND HEAD B-TITE SCREW	3x8 ZMC2-Y		
	144	EG330030	BIND HEAD SCREW	3x6 FCRM3-BL		R
	145	VT669400	PW HEAD B-TITE SCREW	3x15-8 MFC2		
	146	V2728500	BIND HEAD S-TITE SCREW	4x7 MFZN2-BL		
	147	VV220300	BIND HEAD B-TITE SCREW	3x30 MFZN2-BL		
	148	EL300650	PW HEAD B-TITE SCREW	3x8-8 FCRM3-BL		
	149	EP600790	FLAT HEAD B-TITE SCREW	3x8 MFZN2-BL		
	150	VY712800	PW HEAD B-TITE SCREW	3x8-8 MFNI33		
!		VR519500	SHEET, FL	GD		
			ACCESSORIES			
*	200	V6804000	REMOTE CONTROL TRANSMITTER	CRX-E200/E150	RC7060-01-0018	UCRA
*	200	V6804100	REMOTE CONTROL TRANSMITTER	CRX-E200/E150	RC7060-01-0019	BG
	200-1	AAX13340	LID	BLJYE 60050001	60050001	
		VQ147100	ANTENNA, FM	1.4m		
		VR248500	ANTENNA, AM LOOP	1.0m		
		VY952200	PIN-PLUG CORD	2P 1.0m		
		V4135300	SYSTEM CORD	1P 1.0m		
			BATTERY, MANGANESE	SUM-4,AAA,R03		

* New Parts

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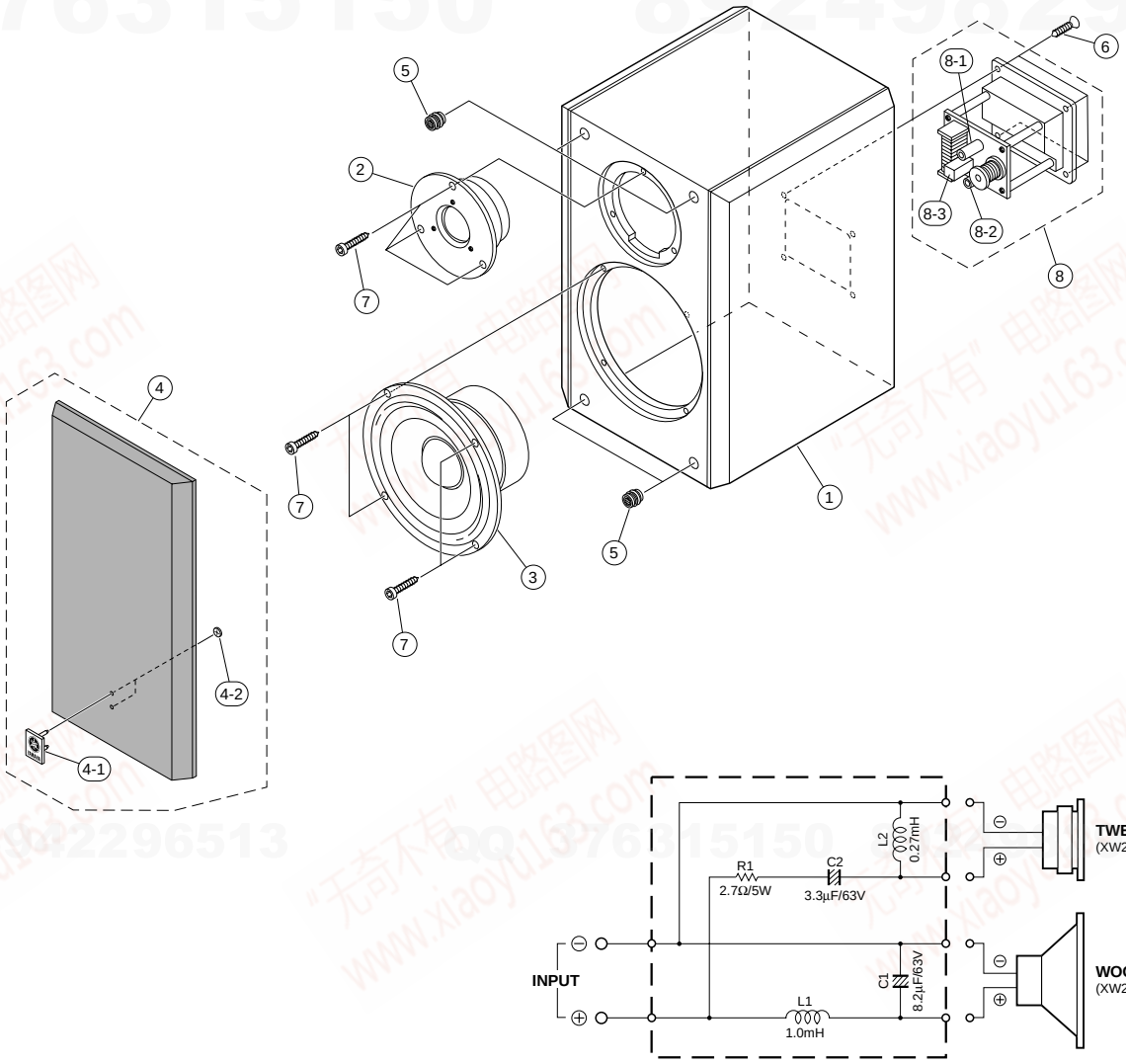
NX-E200



	Ref. No.	PART NO.	Description		Remarks	Markets
*	1	AAX24110	CABINET ASS'Y	BL	001 00000011	
	2	XW275A00	DRIVER	2.5cm 5Ω	XR02502701	
	3	XW276A00	DRIVER	13cm 6Ω	CR13005301	
*	4	AAX24160	FRONT GRILLE ASS'Y		073 00100002	
	4-1	V2192200	EMBLEM			
	4-2	VP161000	PUSH NUT	SPN1.5		
*	5	AAX24170	HOLDER		054 00100011	
	6	EM030180	FLAT HEAD TAPPING SCREW	3.5x20 MFZN2BL	7002792002	
*	7	AAX24140	HEXAGON SOCKET TAPPING SCREW	4x25 MFZN2BL	025 00540250	
*	8	AAX24150	NETWORK ASS'Y		011 07205116	
*	8-1	AAX24130	CAPACITOR	8.2uF 63V	013 08210010	
*	8-2	AAX24120	CAPACITOR	3.3uF 63V	013 03310001	
*	8-3	AAX24180	RESISTOR	2.7Ω 5W	015 02700501	
			ACCESSORIES			
		AAX07730	SPEAKER CODE ASS'Y	4.0m 2pcs/set	6200038201	

* New Parts

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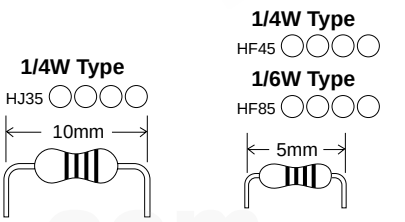
Parts List for Carbon Resistors

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ35 3100	HF85 3100	10 kΩ	HF45 7100	HF45 7100
1.8 Ω	HJ35 3180	❊	11 kΩ	HF45 7110	HF45 7110
2.2 Ω	HJ35 3220	HF85 3220	12 kΩ	HJ35 7120	HF85 7120
3.3 Ω	HJ35 3330	HF85 3330	13 kΩ	HF45 7130	HF45 7130
4.7 Ω	HJ35 3470	HF85 3470	15 kΩ	HF45 7150	HF45 7150
5.6 Ω	HJ35 3560	HF85 3560	18 kΩ	HF45 7180	HF45 7180
10 Ω	HF45 4100	HF45 4100	22 kΩ	HF45 7220	HF45 7220
15 Ω	HJ35 4150	HF85 4150	24 kΩ	HF45 7240	HF45 7240
22 Ω	HF45 4220	HF45 4220	27 kΩ	HJ35 7270	HF85 7270
27 Ω	HJ35 4270	HF85 4270	30 kΩ	HF45 7300	HF45 7300
33 Ω	HF45 4330	HF45 4330	33 kΩ	HF45 7330	HF45 7330
39 Ω	HJ35 4470	HF85 4390	36 kΩ	HF45 7360	HF45 7360
47 Ω	HF45 4470	HF45 4470	39 kΩ	HF45 7390	HF45 7390
56 Ω	HF45 4560	HF45 4560	47 kΩ	HF45 7470	HF45 7470
68 Ω	HF45 4680	HF45 4680	51 kΩ	HF45 7510	HF45 7510
75 Ω	HF45 4750	HF45 4750	56 kΩ	HF45 7560	HF45 7560
82 Ω	HF45 4820	HF45 4820	62 kΩ	HF45 7620	HF45 7620
91 Ω	HF45 4910	HF45 4910	68 kΩ	HF45 7680	HF45 7680
100 Ω	HF45 5100	HF45 5100	82 kΩ	HF45 7820	HF45 7820
110 Ω	HJ35 5110	HF85 5110	91 kΩ	HF45 7910	HF45 7910
120 Ω	HF45 5120	HF45 5120	100 kΩ	HF45 8100	HF45 8100
150 Ω	HF45 5150	HF45 5150	110 kΩ	HF45 8110	HF45 8110
160 Ω	HJ35 5160	❊	120 kΩ	HF45 8120	HF45 8120
180 Ω	HF45 5180	HF45 5180	150 kΩ	HF45 8150	HF45 8150
200 Ω	HF45 5200	HF45 5200	180 kΩ	HF45 8180	HF45 8180
220 Ω	HF45 5220	HF45 5220	220 kΩ	HJ35 8220	HF85 8220
270 Ω	HF45 5270	HF45 5270	270 kΩ	HF45 8270	HF45 8270
330 Ω	HF45 5330	HF45 5330	300 kΩ	HF45 8300	HF45 8300
390 Ω	HF45 5390	HF45 5390	330 kΩ	HF45 8330	HF45 8330
430 Ω	HF45 5430	HF45 5430	390 kΩ	HJ35 8390	HF85 8390
470 Ω	HF45 5470	HF45 5470	470 kΩ	HF45 8470	HF45 8470
510 Ω	HF45 5510	HF45 5510	560 kΩ	HJ35 8560	HF85 8560
560 Ω	HF45 5560	HF45 5560	680 kΩ	HJ35 8680	HF85 8680
680 Ω	HF45 5680	HF45 5680	820 kΩ	HJ35 8820	HF85 8820
820 Ω	HF45 5820	HF45 5820	1.0 MΩ	HF45 9100	HF45 9100
910 Ω	HF45 5910	HF45 5910	1.2 MΩ	HJ35 9120	❊
1.0 kΩ	HF45 6100	HF45 6100	1.5 MΩ	HJ35 9150	HF85 9150
1.2 kΩ	HF45 6120	HF45 6120	1.8 MΩ	HJ35 9180	HF85 9180
1.5 kΩ	HF45 6150	HF45 6150	2.2 MΩ	HJ35 9220	HF85 9220
1.8 kΩ	HF45 6180	HF45 6180	3.3 MΩ	HJ35 9330	HF85 9330
2.0 kΩ	HJ35 6200	HF85 6200	3.9 MΩ	HJ35 9390	❊
2.2 kΩ	HF45 6220	HF45 6220	4.7 MΩ	HJ35 9470	HF85 9470
2.4 kΩ	HJ35 6240	HF85 6240			
2.7 kΩ	HF45 6270	HF45 6270			
3.0 kΩ	HF45 6300	HF45 6300			
3.3 kΩ	HF45 6330	HF45 6330			
3.6 kΩ	HJ35 6360	HF85 6360			
3.9 kΩ	HF45 6390	HF45 6390			
4.7 kΩ	HF45 6470	HF45 6470			
5.1 kΩ	HF45 6510	HF45 6510			
5.6 kΩ	HF45 6560	HF45 6560			
6.8 kΩ	HF45 6680	HF45 6680			
8.2 kΩ	HF45 6820	HF45 6820			
9.1 kΩ	HF45 6910	HF45 6910			



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